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ABSTRACT

A study evaluated the need for environmental education and training in vocational education in South Australia. Data were collected from the following sources: consultations with representatives of 16 organizations in the business, government, and education sectors; survey responses from 298 of 1,430 (response rate 21%) contacted organizations/individuals concerned with environmental management; and survey responses from 27 of 37 (response rate 73%) graduates of programs in the disciplines of land management and environmental health. Most respondents believed that environmental management is increasingly becoming an issue in many jobs. Because of the diversity of environmental management training needs both across the spectrum of the industry and within individual organizations, careful market research and flexible methods for consulting/networking with industry will be required when developing environmental management components for vocational education programs in South Australia. (Sixteen tables/figures are included. Appendixes constituting approximately 40% of the document contain the following: initial project brief; National Centre for Vocational Education Research's response to the initial project brief; list of consultants; environmental management training needs questionnaire; tables summarizing the environmental education needs of volunteers and employees in managerial, professional, technical, administrative, operative occupations; and levels of in-house environmental education currently being provided. Contains 32 references.) (MN)

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Training for a better environment

HUGH GUTHRIE
JANINE CESNICH

An evaluation of the environmental education and training needs in vocational education in South Australia

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NCVER
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Contents

Acknowledgements vi

Executive summary vii

Chapter 1

An introduction to the study

- Introduction 1
- The research approach 2
- This report 2

Chapter 2

What is environmental management?

- Introduction 3
- The context 3
- What is environmental management and the environmental industry? 4
  - The pollution and waste management segment 6
  - The conservation and resource management segment 6
  - The support groups 7
- Th nature of environmental management 8
- Summary 9

Chapter 3

Consultations

- Introduction 10
- Environmental management trends and issues and the impact of the EPA legislation? 11
  - Economics and the environment 11
  - Occupational health and safety 12
- The public sector 14
- Local government 14
- Outsourcing 15
- Volunteers 16
- Environmental developments and training 18
- Training providers 19
- Delivery 22
- Summary 24

Chapter 4

Environmental training needs survey

- The survey 25
- Return rates 25
- Major activities of respondents 26
- Respondents 27
- Company size 27

- Environmental compliance 27
- Political and social pressures 29
- Organisations employing an environmental manager 29
- Major tasks performed by environmental managers 30
- Who has the predominant environmental responsibility? 32
- Major tasks people with environmental responsibility are required to perform 33
- Environmental roles and training needs 35
  - Managerial training needs 35
  - Professional training needs 36
  - Administrative training needs 38
  - Technical training needs 38
  - Operative training needs 39
- Who, when, by whom and where? 39
  - Management 39
  - Professionals 42
  - Administrative 43
  - Technical 43
  - Operatives 44
  - In summary 45
- Training providers 46
- Access to TAFE 48
- Organisations employing the services of consultants 50
- Organisations employing the services of volunteers 51
  - Training of volunteers 51
- Training issues 53
- On-the-job training 54
- Environmental information 56
- Comments and additional information 57
- Summary 65

Chapter 5

Graduates' perspectives

- Introduction 68
- Student background 68
- Further study 69
- Current employment status 69
- TAFE qualification 71
- Environmental management 71
- On-the-job environmental training 73
- Environmental information 74
- Training providers 75
- Training needs 75
- Employer support for training 76
- Volunteers 77
- Comments and additional information 77
- Summary 78

Chapter 6

Other perspectives

- Introduction 80
- Environmental management course—a preliminary proposal 80
- Diagram 1: Environmental management 81
- Green jobs in industry 83
  - Waste management and clean production 84
  - Small- to medium-sized businesses 85
  - Ecotourism 86
- Employment initiatives 87
- Knowledge, skills and attitudes 87
- Environmental management training 88
  - The South Australian Environmental Protection Authority 88
  - Volunteer training courses 89
  - Permaculture 89
- Other environmental training initiatives 90
- Competency standards 91
- University of South Australia 92
- Project managers 92
- Summary and conclusions 93

Chapter 7

Conclusions—where to from here?

- Introduction 95
- Environmental management—the background 95
- Environmental management and training approaches 96
- Areas of specific training need 98
- Curriculum framework and delivery arrangements 99
- In conclusion 100

References 101

Appendices 103

1 Initial project brief
2 NCVER's response to the initial project brief
3 Consultations
4 Environmental training needs questionnaire
Environmental training needs questionnaire:
A graduate's perspective
5 Environmental roles and training needs:
Who in an organisation has the environmental role?
What role do they have? What training do they need?
How many need to be trained?
6 Environmental roles and training needs:
What? Where? When? By whom? How?
7 Volunteers:
What is their main role? What training do they need?
How many require training?
8 Training issues:
In what areas is inhouse environmental training provided?
At what level? How is the training provided?

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- respondents to our questionnaires who wrote in and phoned us to give their points of view. We would also like to thank those who gave their time to support our consultation process. Our colleagues at ACTRAC, Canberra Institute of Technology and the National Training Board also deserve our thanks for information they supplied;

- the support of our colleagues at NCVER who assisted with data processing and clerical support and who made the survey component of the project a relatively painless exercise;

- Bozena Vicary who was the research officer for the early part of the project.

Executive summary

What is environmental management?

Environmental management has increasingly become a focal interest, or at least a component, of many jobs. Some people have environmental management as a primary job responsibility; others at a variety of levels within organisations have jobs with an environmental role. Many jobs also affect the environment to a greater or lesser extent. A variety of training is required at the awareness level at the very least to ensure that all play their part in helping to sustain or even improve the environment.

There are a variety of definitions of the term 'environmental management'. These are discussed in chapter 2 of the report. The terms 'environmental management' and 'environmental industry' can be regarded as too restrictive, given the ubiquitous and potentially pervasive nature of environmental issues on training. In addition, training related to environmental issues has much in common with that required for occupational health, safety and welfare.

A wide range of organisations will have more environmental responsibilities in the medium- to longer-term (such as meeting their due diligence responsibilities) which will need to be supported by appropriate training.

Environmental issues cover a diverse and heavily segmented range of activities. At one end of the spectrum is conservation and at the other is management and minimisation of the detrimental impact of the built environment and man on the biosphere. Environmental matters involve local and State government, private industry and a variety of organisations and services to the wider industry and community.

Who is involved?

The number of organisations who are involved in some way with the management of the environment is immense. As a result, it was impossible to survey all organisations who may have some impact on the environment. A thorough effort was made however to identify and include those organisations/industries thought to have a significant impact on the environment.

While those surveyed were by no means all-embracing of the industries who may be involved in 'environmental management', the survey returns do provide significant information regarding trends and practices in particular areas. In particular the public

sector of State and local government areas has significant responsibilities. Private sector companies and individuals also have significant responsibilities and training needs, particularly those in environmentally sensitive areas and industry sectors.

Contractors and outsourced services will increasingly need to demonstrate that they can meet legislated and other environmental responsibilities. Those using their services will need to demonstrate that they have met their 'due diligence' responsibilities in this area.

What is the occupational framework in environmental management?

Most of those surveyed believe that environmental management is increasingly becoming an issue, or at least a component of many jobs. However, the overwhelming majority of organisations responding indicated that they do not employ an environmental manager. A notable percentage of respondents (12.4%) indicated that there is no one person in their organisation with environmental responsibilities.

Of those who do not employ an environmental manager, the person identified most frequently by respondents as having the predominant 'environmental' responsibility was the owner/manager and those in executive positions (that is, director, CEO, managing director, general manager etc).

The tasks people with environmental responsibilities are required to perform are broad and varied. However, the two most common areas of responsibility cited include environmental law/company compliance and health and safety functions.

Other areas of responsibility can be grouped into the following broad areas: water and natural resource management, technical operative and investigative functions, building/planning functions, public relations/education and other general skills (for example, management functions, administrative operations).

Many of these reflect changing roles and responsibilities within the existing workforce. Therefore the major training needs are to address the shifts in existing occupational responsibilities and roles to meet new or increasingly important job roles and functions. This, in turn, affects curriculum structures and delivery approaches.

What are the various training needs of these occupational groups?

Throughout the report the occupational groups requiring training in 'environmental' management were categorised into four groups ranging from managerial to operative positions.

While the four groups have their own specific environmental training needs, there are also common areas of need. The most

commonly identified needs were in the areas of *general legislative responsibilities* and *environmental awareness*.

Further areas of need common to a number of occupational groups are in the area of technical training and areas with environmental impacts related to *daily operating procedures*.

TAFE potentially has its best market in technical training. Nevertheless administrative, professional, management and operative training needs may also be addressed, particularly if TAFE can support or supply appropriate in-house training.

Meeting the needs of training may involve adjustments to existing programs to ensure that they address environmental issues at an appropriate level, the redevelopment, repackaging and marketing of existing programs and the development of a range of new programs in areas of need not already adequately covered.

These programs need to be developed within a framework which permits awards to be gained if required and allows maximal credit transfer, RPL and articulation. Nevertheless delivery should be focussed on meeting the immediate needs of participants as much as possible. The surveys and consultations revealed a desire for short (between half and one to five days) well-focussed and action-based programs which need not necessarily lead to an award. This suggests the use of problem- or project-based approaches, field days, experiential learning and action learning as suitable delivery concepts.

How many people require 'environmental' training (and therefore what are the developmental priorities)?

Due to the diversity of training needs both across the spectrum of the 'industry' and even within organisations, it is very hard to specify training numbers with any precision.

The numbers seeking training, however, will be determined by the reputation of the training provider, the appropriateness of the program and its structure, its cost and whether it is able to be customised appropriately with a delivery approach which is flexible enough to meet a range of needs. Furthermore, if the right product is available and the product corresponds to market needs then the response from industry, organisations and individuals will follow.

Because the environmental training market is diverse, it is clear that careful market research will be required. This, in turn, may require the development of suitably flexible methods for consulting and networking with industry and its various sectors and interest groups. Strategic alliances with a range of other providers and interest groups may also be valuable.

Chapter 1
An introduction to the study

Introduction

In 1993 Chris Hogan produced a report entitled *Environmental management: Some future directions for DETAFE*. The report (Hogan 1993, p.25) concluded by recommending that:

- more work needed to be done in order to give the area of environmental management internal coherence and structure. This included (eventually) matching educational and employment outcomes, and

- as environmental considerations become more a part of the world of industry and commerce, it will be necessary to identify more clearly industry's requirements in terms of environmentally significant knowledge and skills.

He suggested that:

> *A study needs to be undertaken to establish the nature and priority of these needs and how they can be met. The extent of industry demand for environmentally related courses will then need to be assessed.* (Hogan 1993, p.25)

This report acts upon the recommendation of Hogan's study. In particular, it has been concerned with establishing an occupational framework for environmental education and training in the context of the work roles and related training needs of the various sectors of industry and the community who may have need of the vocational education and training DETAFE provides.

A further project being undertaken by Liz Casha and Tony Dodson will use this present study and existing TAFE offerings relevant to environmental issues, in order to build a curriculum framework based on the occupational framework and information about training demand (and TAFE's perceived role in helping to meet that demand). This latter project involves the development of a curriculum framework which:

- uses and/or updates existing curricula
- takes account of the need for short course development, and
- considers what, if any, award courses may be appropriate in the environmental area.

The research approach

The research approach is outlined in appendices 1 and 2. All the appendices are contained in volume 2 of the report. Appendix 1 is the initial project brief presented to the National Centre for Vocational Education Research Ltd (NCVER) by the Department of Employment and TAFE (DETAFE). NCVER's response to that brief is presented in appendix 2.

The project has involved:

- initial consultations with the Director, Curriculum Services as well as TAFE staff with interests in environmental training from a variety of institutes of TAFE (These consultations have continued throughout the project.);
- individual consultations with representatives of a range of interest groups and organisations (see appendix 3)
- a survey of the potential organisations and groups (including graduates of existing programs) with a potential need for environmentally-related training (see appendix 4); and
- a telephone survey of the relevant program management groups to determine what relevant environmental training is currently being undertaken.

These various sources of information have then been drawn together and their inputs analysed to produce the present report.

This report

The report focusses on a variety of critical questions. These include:

- What is environmental management?
- Who is involved?
- What is the occupational framework in environmental management?
- What are the various training needs of these occupational groups? and
- How many people require training? (and therefore what are the developmental priorities?)

These questions are considered, using a variety of methodologies, throughout the body of the report. The final chapter draws together the various threads and suggests a number of potential courses of action for consideration.

Chapter 2
What is environmental management?

Introduction

This chapter aims to explore the issue of environmental management from a number of perspectives. These include:

- its context (in international agreements, State and national legislation, community attitudes etc.)
- its definition
- the nature of the practice of environmental management. In other words, how the management of the environment is handled across the spectrum of groups, industry sectors and organisations concerned with it.

The context

Much of Chris Hogan's report (Hogan 1993) was concerned with setting the issues concerning environmental management in context. Rather than repeat what he has said, our aim is to summarise his findings, adding any additional information or perspectives which have come to light since his report was produced. In simple terms:

- Australia has international obligations in a range of environmental matters (for example the Agenda 21 action plan arising from the 1992 Rio summit) which, in practical terms, have consequences for workplace practices and training.
- Both politicians and the media have a strong focus on environmental issues at the national, State/Territory and local levels. A range of lobby and special interest groups is concerned to keep environmental matters in the public eye.
- There is a range of legislation concerned with environmental issues at both the national and State/Territory levels. Some of this is locally administered. A range of government and other bodies are responsible for administering and enforcing the legislation. Individual organisations and their staff also bear responsibility for conforming to legislated or agreed guidelines and targets.
- Community and economic pressures are forcing a greater consciousness of environmental matters in community and corporate life. These include community and school education programs, the promotion of environmentally friendly products and processes (the desire of and value to organisations, and even individuals, to be seen as good corporate and community citizens). It is also argued that more attention to the conservation

and better utilisation of a range of resources may not cost; rather it may have medium- to longer-term economic benefits.

As Lynette Wilks suggested in a recent article:

> *Whether in industry, or in the private or community sectors, most jobs can be changed in major or minor ways to cause less environmental damage.*

This is the nub of our brief, to explore to what extent and in what ways the organisation of the workforce and a whole range of occupations will change to address this emerging concern. This refers to the management of the environment as an employment area in its own right, together with changes in work roles for many existing occupations. Leading on from this, of course, is how any training implications arising from these changes can be addressed.

What is environmental management and the environmental industry?

Environmental management is a ubiquitous term and, in many cases, does not provide an adequate functional description of the great range of activities involved in fulfilling the job requirements of a range of occupations covered under its broad umbrella.

There are many and various definitions of the term 'environmental management'. The discussion papers prepared as part of this project defined it as:

> *. . . the process of change whereby environmental and economic performance are integrated for the benefit of both an organisation and the community. That is, the exploitation of resources, the direction of investments, the orientation of technological development and institutional change are made consistent with future as well as present needs. Environmental management, therefore, has its basis in the philosophy that the quality of life now and for future generations can be increased. This improvement of individual and community well-being and welfare can be achieved by following a path of economic progress that does not impair the welfare of future generations. Furthermore, it allows for a provision of equity between generations.*

This definition was derived from a number of sources (Beirbaum (ed) 1991; Scott 1993, Ecologically Sustainable Development, 1990, Australian Manufacturing Council 1992.

This definition is a philosophical one in that it is based on a change in corporate and individual mindset to realise:

- an improvement in the link between good economic and good environmental management

- the value of a concern for the environment in the medium- to longer-term, possibly at the expense of immediate economic gain, and
- the fulfilment of social/community responsibilities either through conscience and/or because of legislative requirements.

Environmental management has increasingly become a focal interest, or at least a component, of many jobs. There will be individuals whose primary responsibility is environmental management. They will be responsible for helping to monitor and manage a component of the built and/or natural environment. It will be a major responsibility of their job. They may be employed in government or in community-based organisations or within individual organisations in the private sector. In addition there will be others at a variety of levels within organisations both in the public and private sectors, in cities, towns and rural areas, whose jobs have an environmental role whose work affects the environment to a greater or lesser extent. These people may therefore require training at the awareness level at the very least to ensure that they play their part in helping to sustain or even improve the environment.

A recent draft ACTRAC report on environmental technicians and field officers has coined the term 'environmental industry' (Scott 1993). It has been defined as:

- one which supports and implements the stated principles of ecologically sustainable development (ESD);
- is involved directly in environmental management activities;
- assists industry and business groups to protect, conserve and improve environmental systems through the supply of products and/or services; and
- is involved in these activities for a major proportion of their time.

It, too has the long-term perspective of the earlier definition and may include (according to the OECD) those organisations which produce pollution abatement equipment and a range of goods and services for environment protection and management. Thus the industry also includes organisations which are service providers and producers of technology. Predominantly they may be involved in the management and minimisation of solid, liquid and gaseous discharges. It is therefore at the 'brown' end of the environmental continuum. However Scott's report acknowledges that the environmental industry embraces a continuum which is from 'green' to 'brown'—from preservation, through restoration and reclamation of the natural environment (at the green end) the built environment and industry, and the attendant environmental issues and problems raised (at the brown end).

From this it can be seen that an extremely broad range of activities and issues surrounds concepts of environmental management of and incorporates within it a wide range of work roles, needs and

contexts. This, in turn, provides particular challenges to a training system such as DETAFE which is attempting to respond to these wide-ranging needs. It certainly means that the training response must occur at a variety of levels, and in a variety of ways.

Scott and his colleagues (Scott 1993) have argued that there are three major segments of the environment industry. These are:

- pollution control and waste management (the more brown end);
- conservation and resource management (the more green end);
- support groups to the segments identified above, including a 'general' support, as well as others concerned with education and training and research and development.

The pollution and waste management segment

More specifically pollution control and waste management has as some of its major activities:

- engineering services (design, construction, installation, consulting etc.);
- liquid, solid and hazardous waste minimisation and the management, treatment and disposal of waste (including water and waste water treatment);
- recycling;
- energy conservation and management (including alternative energy systems);
- air pollution;
- noise management;
- monitoring and control services.

This segment is concerned more with the built environment and with a range of industries or industry sectors—as well as both small and larger enterprises. It may be concerned with extracting and processing industries (for example, mining and petroleum), manufacturing (including industries whose processes or products have potentially high environmental impact) as well as the retail and service sectors (for example, petrol stations, hairdressers, restaurants etc.) whose cumulative poor practices can have significant environmental impacts.

The conservation and resource management segment

The conservation and resource management segment on the other hand is made up of a diverse range of industry groups and enterprises, government departments, agencies and other bodies. These are concerned with environment management processes and practices for the conservation, restoration and sustainable use of renewable and non-renewable natural resources, with particular reference to both native and exotic flora and fauna and the systems on which they depend. Thus the segment is concerned both with

the development and exploitation of the natural environment (for example, farming, mining, forestry, ecotourism etc.) to one which is concerned more with conservation and preservation (for example, the maintenance of biodiversity). Exploitative processes may be geared to sustainability; however, they may also be concerned with improvement, reclamation or regeneration. Its major interest areas include:

- environmental management (for example, environmental policy, planning, auditing, assessment, monitoring);
- open space planning, management and use (including land use and rural property planning; soil, vegetation and habitat management; integrated pest management; recreational access management; fire management in a variety of areas including national parks and reserves, coastal areas, state forests, urban parks);
- total catchment management (for example, landcare, soil conservation, water quantity and quality, farm management, conservation of significant flora and fauna);
- heritage conservation;
- ecotourism; and
- sustainable agriculture, forestry, fisheries, mining activities etc.

These two aspects (pollution control and waste management on the one hand and conservation and resource management on the other) represent the extremes of a continuum, with circumstances in a range of dimensions helping to determine the degree of 'greenness' or 'brownness' with which they are concerned. Thus there is a considerable degree of overlap in the needs of the two segments, although the needs may be focussed towards different ends.

The support groups

There are also a range of support groups concerned with factors such as equipment supply, laboratory services, legal services and a range of other services which are essentially peripheral to, but necessary to meet, an organisation's needs. Support groups may also include enforcement or regulatory bodies or be drawn from consultants or legal firms. Other groups provide environmental education and training (including consultants, private providers, government or locally sponsored environmental action programs, TAFE, the universities). Other training may be provided inhouse by individual organisations or enterprises as a part of meeting on-going or retraining needs, or in the induction of new staff. A range of government, university and individual companies provides research and development support to the wider environment industry.

Finally the environmental movement supports a range of volunteer groups concerned with environmental matters as well as a range of lobby groups who draw their predominant support from members of the general public (for example the Wilderness Society,

Greenpeace and the Australian Conservation Foundation). These groups may also have training needs, particularly those involved in volunteer activities in support of the various components of the broader environmental industry. There is also a range of professional and other associations involved in whole or part with environmental issues. These include such groups as industry training advisory bodies (for example those concerned with local government, the rural sector, forestry etc.) the Environment Management Industry Association of Australia (EMIAA), the Clean Air Society and others. These groups are particularly concerned to ensure that their interests and needs are properly recognised, particularly by government and training providers.

The nature of environmental management

From the preceding discussions it is clear that many issues are involved in the definition of 'environmental management'. How the term can be—and is—perceived helps us to understand its dimensions and boundaries. This is particularly important in helping to establish the training needs, those needing training and what role, if any, TAFE in South Australia might play in the process. The environmental industry is split into a large number of segments, each with their own diverse needs and priorities.

The term 'environmental management' seems generally unsatisfactory because it becomes too readily confused with job titles such as environmental manager. The definition given here and the related discussions of the concepts, however, imply so much more both in work role and training terms. The potential roles and responsibilities individuals have in this area are broad, as is the range of individuals involved.

Natural resource management is also a difficult term in that it is heavily biased towards the green end of the environmental spectrum. The term 'environmental industry' also has it limitations. Although the various segments describe a spectrum of activities it is, in fact, sometimes an 'industry' in its own right and at others a component (and often a very minor one) of other industries and jobs.

In the context of what TAFE may be concerned with in environmental matters, the training issues and roles parallel (if not overlap to some extent—if that is geometrically possible) our conceptions of occupational health and safety. This parallel is drawn because:

- occupational health and safety is (and should be) a fundamental concern of good work practice and is therefore a theme in many program offerings. Its relative emphasis in a program of training is dependent on the relative hazards involved in not observing good practice (as they are with environmental issues and practices);

- occupational health and safety is a predominant responsibility of some individuals in the workforce, and of a variety of government agencies and other groups. Likewise environmental matters may be an individual's whole job, a major area of responsibility or an aspect of their job. It has notions of being a core or peripheral component (albeit sometimes an important peripheral component) of a variety of work roles;
- it embraces notions of 'prevention' and 'cure' as potential extremes of at least one of its many dimensions;
- it carries the notion of an immediate if not future economic, social and infrastructure cost if not adequately addressed. (And these costs may be significant.)

Nevertheless there is a far greater social consciousness about environmental matters than about occupational health and safety which makes it a particularly important political issue (and in this sense the parallel is not as strong). On the other hand the impact of legislative requirements on occupational health and safety practices in the workplace may be far greater at this time than those arising from environmentally related legislation.

Summary

Australia has international obligations which require, ultimately, that training in environmental issues be addressed. In addition there are community, political, media and, increasingly, economic and legislative pressures to improve environmental practices.

As such environmental issues potentially touch a wide range of TAFE's offerings and affect them to a greater or lesser extent. It is clear that:

- the environmental training market is a broad and a heavily segmented one;

- while the environment is a linking issue, many of the practical implications relate to the use of existing curricula and training which is applied within a different philosophical framework (i.e. one which is more environmentally conscious);

- the responses to environmental training needs has been, in part, brought on by the introduction and increasing concern with occupational health, safety and welfare issues. A reflection on the introduction of OH&S training into TAFE programs offers considerable potential to teach us about what should be the do's and don't's of TAFE's response to an increasing environmental focus in its training.

Chapter 3
Consultations

Introduction

Consultations were carried out with individuals representing the following sixteen organisations and groups:

- Department of Environment and Natural Resources (DENR)
- Department of Environment and Natural Resources (DENR) - Water Resources
- Department of Primary Industry - Forestry
- Local Government Training Authority
- Local Government Association
- The Environment Protection Authority (EPA) - Policy and Planning
- The Environment Protection Authority (EPA) - Training
- SA Economic Development Authority
- Engineering and Water Supply (E&WS) - Trade Waste
- Engineering and Water Supply (E&WS) - General
- Chamber of Commerce
- WorkCover
- SA Health Commission
- The University of South Australia
- Country Fire Services
- Environmental Resource Centre
- The Volunteer Centre
- Australian Environmental Education Association
- The Port Adelaide Environmental Resource Centre

A number of informal consultations (i.e. by telephone) also took place during the course of the project with representatives of organisations such as the Royal Adelaide Hospital, the Clean Air Society, Permaculture Network (SA), Landcare and the Port Lincoln Aboriginal Organisation.

The names of those consulted and their respective organisations are provided in appendix 3. In several cases two branches within the same organisation were consulted.

The researchers confined the consultation process predominantly to public sector organisations for a number of important reasons. These were:

1 Survey returns suggested that the major primary market in the environmental area for TAFE is the public sector. There is however a flow-on to other sectors because of government requirements.

2 There is an expectation, by the community at large, for the public sector to initiate good environmental practice and therefore be the first to adopt best practice techniques (and thus access or require training in the area).

3 Large private organisations who are experiencing a 'cultural shift' towards increasing their environmental responsibility tend to train their staff inhouse using programs and guidelines developed and controlled by head offices, often located interstate or even overseas.

4 Smaller private companies, as suggested by survey returns and informal feedback, are not, as yet, fully (if at all) aware of their environmental responsibilities. *Environmental issues are not on the top of their lists of priorities.*

Environmental management trends and issues and the impact of EPA legislation

> *When the Environment Protection Act is proclaimed in South Australia, companies will be forced to take environmental issues seriously.*

This was the clear message expressed by several interview participants. At present, many businesses are not operating at acceptable standards of practice in environmental management. The delay in the proclamation of the Act gives organisations time to come up to scratch. In addition, following proclamation there will be a campaign of education, presenting a significant opportunity for TAFE. However, it is felt that some organisations, and particularly smaller ones, are unlikely to take the Act and process seriously until litigation and prosecutions have occurred. This was certainly the experience with OH&S legislation and it is likely that the EPA legislation will mirror this experience.

As we pointed out above, many of the larger companies operating in South Australia are already being driven by the Melbourne and Sydney EPAs or even by requirements from overseas because of their multinational operations.

Economics and the environment

At present, a major disadvantage with environmental management and its implementation is that, because it is a long-term issue, many people find it difficult to comprehend in the short-term.

> *Industries tend to have a very immediate focus. A message comes across, they get it dealt with quickly, and then it fades.*

However, with the new Environmental Protection Act being far more rigorous than any previous 'environmental' legislation,

managers in particular, will need to become fully aware of the implications of the new legislation (and its subsequent implementation).

This will mean that chief executive officers and managers of a whole variety of organisations will need to focus, more than ever before, on issues such as environmental law, regulations, economics and so on. The increasing importance of such issues has been confirmed by survey returns discussed in chapter 4. It will become increasingly important for organisations to know how to operate in an environmentally acceptable way, and to improve their practices over time while still maximising their rates of return and remaining profitable.

A significant issue raised during the consultation process was that, often, the obligation to improve the environment for future generations tends to fall on the shoulders of private industry.

The gap between ideal environmental practice and the dollar reality, therefore, needs to be reconciled. At present, it is still a dominance of the economics of necessity over the environmental considerations. Business economics is, not surprisingly, based on maximising return. This rationale is bound to change as many organisations evolve and shift their culture to one of greater environmental responsibility. Moreover, many organisations will eventually just be forced to change their ways by the legislation and by the threat of expensive litigation and possible prosecution if their environmental practices are seen as unacceptable. However this 'threat' is not presently a strong one and so there is relatively little real incentive for unwilling organisations to be concerned for the environment in practical ways.

Occupational health and safety

A strong link was drawn between occupational health and safety and environmental management in chapter two of this report. This link was also made in a number of the interviews. However, one main difference was stressed. OH&S has legislation very firmly behind it and as one participant stated 'the penalties are getting tougher all the time'. Occupational health and safety claims also cost organisations money in terms of payouts, insurance premiums and lost productivity. Cause and effect relationships between priorities and outcomes are more immediate and clear. OH&S has also been around longer and is more potent both as an industrial and economic issue.

OH&S is therefore presently seen, because of the legislation and other factors, as a more pressing issue than environmental management within organisations. In the area of OH&S, work behaviours are being changed so that changes in attitudes can follow. These, in turn, should reinforce behaviour (for example,

legislation and the threat of prosecution makes people wear bicycle helmets and safety belts).

TAFE and course designers have had an input into changing behaviour and attitudes in OH&S at the early stages. They play their part in an educative process. Much the same could be done in the environmental area.

The development and implementation of better approaches to OH&S in industry and commerce may therefore have some lessons for the implementation of better environmental practices and the attendant training needs. Potentially much can be learnt from the successes and shortcomings of developing and implementing OH&S training.

In the environmental area, attitudes to the environment are being changed first so that people will eventually change their patterns of behaviour. This strategy is making change in the environmental area much slower. OH&S laws, litigation and the costs of non-productive staff, particularly productivity losses through poor OH&S practices, are forcing people and workplaces to change their behaviour, and consequently the *stick* approach is a far quicker at achieving change than that of the *carrot*.

Using the waste management sector as an example the Green Jobs Unit report states the most frequently cited obstacle to further growth in the area was the lack of clear and uniform regulations and failure to enforce regulations.

> *As long as environmental protection is not enforced, only innovative and environmentally committed companies and utilities will seek out equipment and know how which enables them to reduce negative impacts on the environment...*

The same can be said for training:

> *Assistance measures, incentives, financial options, extensions of information and the promotion of success stories are necessary to encourage the implementation of environmental audits and the training of works in shop floor waste management and cleaner production.*

Much of the environmental impact will be brought about by technological improvements—this will be a big player.

However, it has been suggested that the 'stick' approach will come into the environmental management area more in the medium-term. With the Environmental Protection Act being proclaimed in 1994 there should be, over time, significant changes in behaviour both by organisations and the individuals within them. It has also been predicted that there will also be a very strong demand for training building up over the next five years or so. Whether this training need will be met inhouse or externally or by a mixture of both approaches is difficult to determine.

The area of environmental management will also see significant developments over the next few years, specifically in terms of increased community and industry consciousness, improved approaches to better environmental management and the development of new or improved technologies to support improved

environmental management practices and promote ecologically sustainable development, for example, through waste minimisation.

The public sector

Being environmentally aware (socially, politically and practically) is a particularly important issue for the public sector. As stated by one interview participant:

> *Government agencies have a community service obligation. They have an obligation to look after people, be good land managers and adopt best practice techniques.*

The clear message therefore is that government departments will need to be 'environmentally' focussed and their staff will need to be increasingly environmentally aware. In essence, the public sector is expected by the community at large to initiate and ensure good environmental practices.

Such a focus and the changing nature of the workplace will have repercussions on labour market skills. As suggested during one interview, *the workforce needs to be more sophisticated—today park rangers are negotiating with companies like BHP*. The government sector, in turn, demands good practice from those who provide services to it, so it is both a flow-on and circular effect. Increasingly, good environmental practices and track record will become a condition of tender for government work and the provision of services. (Refer to the section on outsourcing later in this chapter.)

Both the consultations and survey returns confirm this trend. That is, an increasing number of occupations within the South Australian labour market have an environmental management component (be it the entire position or merely a very small component of it). As highlighted during one consultation, the 'environment' industry is 'growing and evolving remarkably. Furthermore, occupations within it are becoming increasingly disparate and diverse' (i.e. scientists, volunteers, pest controllers, engineers etc.).

Local government shares many of the trends outlined above. Their environmental requirements will flow through to those who provide goods and services to such agencies. Moreover local government officers have significant monitoring responsibilities enshrined in legislation. Many of these responsibilities have a direct effect on the environment and require training and retraining.

Local government

Local government is one example where the skill base of its workforce is evolving to meet new responsibilities. However, this is not matched by employment growth. This is *predominantly* a

retraining need. Legislative requirements are increasing and strengthening local government's role in a number of significant areas (e.g. discharges into water courses, devolution of responsibility from the Country Fire Service to councils, land management).

As the role of local government is gradually strengthened and broadened, councils will need to be able to access people with the skills and ability to carry out the new tasks. Obviously this has important training implications, as the traditional skill base of those who work in and for local government must change by broadening or refocussing their workplace skills to accommodate new demands.

However, as pointed out during one consultation, broadening local government responsibilities does not necessarily translate into an increase in employment opportunities. What it is more likely to mean is that the existing skill base will need to be 'rejigged' so that existing staff are flexible enough to take on new or extra responsibilities, while possibly shedding or outsourcing others.

Outsourcing

Increasingly everything is going out to contract

As stated previously, while the areas of local government responsibility are growing (through the State government outsourcing to local government), the numbers employed directly by local government are not following suit. Increasingly work is being contracted out (e.g. waste management, recycling). Local government is not unique in this respect, as many government departments are now outsourcing work to contractors.

As more work is contracted out, it will become imperative for contractors to prove that they are environmentally responsible and have undertaken some formal or recognised training. For example, as stated during one interview, 'our organisation will tell contractors that they must be environmentally diligent and that they must go to a training provider and get the necessary skills'. For example, the Royal Adelaide Hospital's waste management contractors will be asked to provide training to staff as part of their contractual obligations. Operators of facilities will need to show due diligence and environmental awareness. The hospital is also looking at putting pressure on suppliers of their goods and services (who contribute to the generation of waste) to look to ways that help the hospital minimise its waste.

It is true that private industry also outsources some environmentally sensitive practices. One critical concern will be to ensure that the contractor does not embroil the company in any litigation and therefore the company's due diligence requirements may need to ensure that the contractor is performing their functions in an acceptable way.

It will therefore be increasingly important for contractors to demonstrate that they are sufficiently skilled so that those employing their services will not be liable, in any way, for their actions (i.e. mutual liability, OH&S, WorkCover).

If employers are liable for the activities of those they contract, their first concern (as expressed by one interview participant) is whether their contractors possess the necessary understanding and skills to fulfil the contract.

Unfortunately, survey returns tend to suggest that those who contract their services are, on the whole, not aware of their training needs or their environmental responsibilities. (This was also confirmed by the consultation process.) Numerous respondents to the training needs survey replied by saying 'I am only a 1-2 person operation (or a family business), this is not relevant to me'. They only see training needs as being relevant for others, that is, those they employ, *not* for themselves.

Contractors will therefore need to realise that in order to be competitive they will need to undertake some form of training. A pertinent question raised during one consultation was *who will train the contractors?* This again, presents a window of opportunity for TAFE. However, those contractors who are small businesses or self-employed will present considerable challenges to TAFE in terms of reaching them and delivering training which is seen as useful. This issue will be picked up again in chapters 4 and 6.

Volunteers

In addition to outsourcing, a number of government departments (and local government too) is increasingly using the services of volunteers.

While the core is shrinking, reliance on and the numbers in the periphery (i.e. volunteers) is increasing.

This trend should also have a significant impact on training needs. Both contractors and volunteers will need to be sufficiently trained so that their 'employers' feel confident about outsourcing work to them.

In issue 5 of *Volunteering*, the article 'The risks of volunteering', by Joy Noble raises many important issues/matters of concern. As Noble states:

> *To a volunteer, the fact that there may be risks involved in their work, is perhaps the last consideration! But if the large number of enquiries [that] volunteer centres receive about insurance cover is any guide, potential and real risks are of great concern to managers of volunteer programs.*

While Noble is speaking of risks such as physical injury and financial loss to volunteers, in the not-to-distant future, due

diligence will undoubtedly be among the risks for consideration by employers of volunteers.

In terms of physical injury and occupational health, safety and welfare, Noble highlights the importance of training, that is, regarding the use of equipment and handling of substances.

Noble states that there are a number of issues which need to be considered in terms of tailoring an organisation's requirements to the insurance which best meets the organisation's needs. He asks, for example: what level of skill and training of volunteers is necessary to protect them against unnecessary risk?

As well as the responsibilities of the employers, Noble identifies the responsibilities of the executive officer and the Board. Board members and the executive officer must understand their responsibilities and ensure that proper practices and procedures are in place in relation to financial management, legal requirements and service provision'. One, for example, is to appoint and, where necessary, train a person who is responsible for overseeing the volunteer programs and ensure the duty statement includes provision for the direction, supervision and safety of volunteers.

In terms of the responsibilities of the manager of a volunteer program, a manager needs to ensure health, safety and welfare measures are adequate in relation to work site, conditions, equipment and clothing, as well as in the provision of adequate training and supervision.

The Volunteer Centre of South Australia runs a number of training courses throughout the year. Courses include:

- introduction to volunteer management
- working with groups
- local government forum
- leadership
- train the trainer
- conservation and the environment
- the short term volunteer

A letter sent to us by the Australian Trust for Conservation Volunteers stated that:

> *We at the Australian Trust for Conservation Volunteers are keen to see this type of training being offered (i.e. environmental management training) to both our volunteers and the general community.*

The Centre added that they would be pleased to be of assistance in the process having recently developed a curriculum for the Local Environment Assistance Program (LEAP).

They only want to do the job they are interested in doing and no more.

Unfortunately however, as stated during one consultation, it is often very difficult for volunteers to find the time to attend training sessions (often they just lack the inclination). They only want to do the job they are interested in doing and no more.

It was suggested that trainers must make it worth the while of volunteers to come along to training session.

On the other hand, one interview participant expressed some concern that 'many training providers only consider the training needs of paid workers'. That is, training providers need to realise that a lot of those who look after the environment are volunteers. As a result it is potentially a significant group in terms of training needs.

It is difficult for volunteer organisations and those using their services to provide volunteers with the necessary training, specifically because of the numerous tasks they undertake. A representative of one of the volunteer-based operations we contacted pointed out:

> *Because volunteers do absolutely anything and everything, this Centre can't train people, as the skills base is so diverse.*

It is therefore the job of the employers or users of the skills of volunteers to ensure that they are aware of environmental concerns and that they do have the appropriate environmental management and practical skills.

Increasingly organisations are saying to volunteers that there are some pre-conditions to for example, their using the services of volunteers, including some training requirements (e.g. Engineering and Water Supply, Country Fire Service). This will become more important in the future as legislative requirements need to be met. This, again, presents an opportunity for TAFE but there may be significant delivery and funding issues to be considered. (Refer chapter 3, p. 22)

Environmental developments and training

One particular problem with providing training in the area of environmental management as highlighted during one consultation is that 'at present training is extremely opportunistic; it is difficult to predict what we are going to need.

There are many questions which, at present, are difficult to answer. Questions were raised such as:

> *How does the department ensure that all the people 'employed' are multiskilled? (DENR)*

With so many different sectors within government departments, there are equally so many training needs. How are these training needs identified in the department?

While certain members of staff are trained in substantive disciplines (for example engineering) and are placed in a specialised role which reflects their qualifications, in many cases staff are not. Therefore, a high degree of flexibility is needed within staff members.

A further major difficulty with providing training in the area of environmental management is that needs are spasmodic, and needs often depend to a great extent on what are the particular issues of the month (recycling, herbicides, chemical codes of practice).

Therefore, training needs to be flexible enough to allow organisations to access training in areas which are important to them at the time of need. This requires a range of programs which can, in a sense, be switched on and off on the basis of demand.

Concern was expressed during one consultation that organisations providing training (such as DETAFE) tend to get locked into formalised training programs. These programs are seen as rigid and it is believed they cannot be adapted quickly enough to changes taking place in the workplace (including technological advances).

Flexibility in program structure, content and delivery, therefore, are very important issues. The ability for institutions to upgrade and change their programs readily is extremely important. Establishing networks to exchange information and learn relatively informally (instead of more formal training programs *per se*) was suggested as one of the best ways to keep up with the changes. Furthermore, building up contacts with a number of different organisations will be essential to maintaining program relevance.

Training providers

During the consultation process it became very clear that there exists a plethora of environmental management training providers in the South Australian market.

One interviewee was particularly concerned about the vast array of courses available in the area and their quality control (or, more particularly, the lack of it).

Training providers in the area include the three South Australian universities, interstate universities offering courses by correspondence, TAFE, the Local Government Training Authority, private consultants, the EPA, the Environmental Learning Forum, the Clean Air Society, the Australian Trust for Conservation Volunteers, just to name a few.

Comments made in relation to current environmental training providers included:

- *TAFE doesn't consult enough with industry. This creates enormous confusion. As a result, industry tends to be on the back foot, as its core needs are not being met.*
- *Private providers may provide a good service, however, they are often very expensive. Cost therefore is an inhibiting factor in using them more widely.*
- *Certain ITABs have already done a lot of work in the area of environmental management. Perhaps TAFE could link into or adapt such developments.*
- *TAFE must be good at what it does, it must have an reputation which emphasises follow-up. It must have an image which is credible to private industry.*
- *TAFE needs to develop a strong marketing strategy and strategic alliances with other institutions and bodies.*
- *There are a lot of bits and pieces around at minimum cost, however it [the training] is not necessarily good quality.*

Consultations highlighted that there is definitely a role for TAFE in the area of environmental management, particularly on a 'contact-needs basis' (i.e. clients contacting TAFE when they have a specific need they have to fulfil) where TAFE can be responsive at a cost-effective rate.

Numerous suggestions were made by those interviewed on how TAFE could play a role in the area of environmental management. Suggestions included the following:

- *The concept of ESD is currently the popular 'buzz word' in industry. Numerous industries and organisations are working towards ESD. Therefore it may be appropriate for TAFE to put together a series of courses under this banner (both general and specific) and promote it widely to industries and organisations as 'Education for the environment.*

- *There is a great need for courses aimed at reskilling existing staff (i.e. waste minimisation, recycling). This is an ideal market for TAFE.*
- *With the ensuing demand on environmental management (through the EPA), there may well be a role for TAFE to train people within organisations on how to implement environmental management, how they should take it to the next step and what they should do when they get back to their organisations, councils, workplace.*
- *There are a lot of elected members [of district and local council] who want bits and pieces of practical on-the-job information and they want it strategically allocated. These people need to be carefully targetted. Not all providers can do this. There is however a role for TAFE in this market.*
- *Since the Water Resources Group developed their 8 strategic goals, two handbooks have been developed on how to handle environmental management, however, it is felt that the workbooks need to be used in*

conjunction with an appropriate trainer who can take people through the process.

- *A course for junior operators in the metal finishing industry would be a great help.*
- *Waste minimisation is a very important area. A lot of industries need to be educated on how to minimise their waste. TAFE therefore has an awareness role to play in this area.*

The participant who made the point immediately above, went on to say that in relation to trade waste, his department must deal with people who are already in full operation, 'in many cases this is just too late as many operators don't see waste as an integral part of their business'.

Thus it was felt by this participant that it is important to educate people before they start operating businesses or in initial operative or trade training—just as is done for occupational health and safety. Specific modules might focus on environmental issues and may become the focus of individual learning outcomes or assessment criteria in other course components.

There is a need to target and educate those who are learning the trades. This point was also expressed during another consultation.

It is absolutely essential that environmental management be part of an existing training package; it is not necessary to make it a separate thing. It should be an integral part of training. This does, however, depend on how detailed the knowledge needs to be.

Specific areas which could be incorporated into existing training courses suggested during one consultation included introducing sewer/discharge modules into a number of TAFE courses. This particular participant made it quite clear that his organisation would be more than willing to provide TAFE with all the necessary information and support.

The current environmental issues outlined above are dealt with in detail in chapters 4 and 6.

Current strong environmental issues

- *Water management*
- *Pollution*
- *Waste management and minimisation*
- *Greening*

In terms of inhouse training a number of representatives from the departments consulted stressed that it is often difficult (in terms of personnel and time) to develop and provide internal training programs, 'In many cases it simply is not cost-effective'. Therefore, there is a reliance on the services of outside training providers such as TAFE.

Several departments consulted are currently briefing their staff members on the implications of the new Environmental Protection Act and updating their staff in relation to new regulations (for example, Forestry, conservation/environmental protection). However, it was stated that because training is not a core function of the department, they would prefer it if a private provider or TAFE could run such information training sessions.

A private consultant was used by a particular department to brief staff on the Occupational Health Safety and Welfare Act.

In addition to training provided by the universities, TAFE and so on, there is also a number of employment and community education programs operating throughout the State (for example Landcare funding program, LEAP, REEP [refer chapter 6]). Such programs are providing participants and the public with information on numerous environmental issues as well as with tangible improvements to the environment. In turn, the community is responding to and doing something with the information provided.

The Mt Barker Catchment Centre is another example of involving and educating the community in environmental issues. The Centre runs demonstration programs whereby examples of good practice are set up on people's properties. People have the opportunity to inspect these and ask the landholders about it. It is a networking approach which some stated they found more effective and immediately useful than a training program. These networks could be developed or supported through institutes of TAFE and the subsequent activities built into more formalised programs through project work, plans, discussion groups etc. This presents a further training and development opportunity to be incorporated within the curriculum framework.

Delivery

Consultations and survey returns suggested that while certain occupational groups may have similar training needs (that is, managers/technicians requiring training relating to environmental legislation/regulations), it was stressed that the training should be pitched at a variety of different levels. Therefore, it will be essential to provide different levels of training within the same broad content areas. As one employer explained:

> *We will not pay for certain staff members to learn beyond the core. We will pay for training in core areas, but no more. The bottom line is money and cost effectiveness. Fitness for purpose, no more, no less.*

Short courses have a limited life. They need, therefore, to be integrated into something that can be recognised. Staff need to be able to undertake training for which they can ultimately get recognition or a more formal qualification if they wish.

The discussion regarding course length also raised a number of valuable points.

While most of those consulted and surveyed tend to favour 'short, sharp, snappy' courses (i.e. three to four days) they added the proviso that the courses should integrated with something that can be recognised. (Refer to chapter 4 for a more detailed breakdown of course length by occupational group.)

It was suggested on numerous occasions that short, sharp courses, on a needs basis, should be made available within a structured

framework. That is, there is a need for provision of 'one-offs' within a more integrated program structure.

A smorgasbord of modules and delivery approaches within a framework would be an appropriate well from which everyone could study their area of interest, at their own pace, with encouragement to go back and do further study.

Another participant expressed the view that TAFE needs to offer a range of subjects, over a period of time, so that organisations can meet both their immediate training needs and their non-immediate needs. That is, 'provide training on a "switch-on, switch-off" basis'.

One of the organisations consulted ran a number of one-day workshops in conjunction with a private training provider. The topics covered included odours, clean air etc. It was felt, as a result of the workshops, that while the training was beneficial more substantial courses are also needed (for example, 13, 26, 52 weeks, two to three hour sessions in areas such as environmental auditing, noise monitoring etc., incorporating inhouse workshops). The training 'products' and their various delivery approaches require a measure of market research and segmentation.

In this way the training is delivered to each of the 'segments' with content and in forms which best meet their needs. The consultative arrangements being put in place through this project's sister project on curriculum frameworks should provide a sound basis on which to begin this more detailed market research and marketing.

Preference was also expressed for simple training structures which are decentralised and flexible. Articulation with other existing courses was also seen as integral.

Flexibility and simple training structures are particularly important in the area of environmental management training, simply because of the great variety of needs that exist in the area, ranging from the needs of management through supervisory to those of operational staff.

Providing a flexible training structure is also essential for different regions (for example, different council regions have different ways of dealing with waste management and have different problems and priorities). This, in turn, has implications for program content and the delivery approaches used.

There needs to be flexible movement into and out of any environmental training program. There should not be a structured end time.

One interview participant expressed the view that TAFE should target three to four key organisations (e.g. local government, Department of Environment and Natural Resources, Engineering & Water Supply) and, together with these organisations, develop appropriate training structures, which result in ideal training career pathways from bottom to the top.

At the end of such training the appropriate skills should be developed and a qualification should be presented.

Other suggestions made during the consultation process included the desire for TAFE to provide organisations with a 'shopping list'

of training options developed in close consultation with the various organisations.

Summary

The delay in the proclamation of the environment protection legislation, together with the period of adjustment that industry and other key players will be allowed, presents TAFE with an opportunity to develop a range of programs which can be delivered in a variety of ways and customised to suit the needs of particular end users. Much of relevance can be learnt from the development, implementation and delivery of training programs or program components concerned with occupational health, safety and welfare.

DETAFE's approach to environmental training will require it to market its programs to individual segments of this wider market. Nevertheless, it is clear that TAFE could focus, at least initially, on the local and State-wide needs of government.

These needs should reflect not only the training needs of the departments and local government authorities concerned but also the contractors and volunteers who are increasingly being used to provide products and services to government.

DETAFE and relevant institutes of TAFE throughout the State should consider:

- allocating the development of specific aspects of the framework to particular institutes;
- adopting a network approach to the delivery of environmental training by DETAFE;
- using flexible consultative structures and delivery approaches to address the training needs;
- actively co-operating with a range of government departments and local government authorities to address the training needs and priorities;
- developing strategic alliances with a range of other providers and pertinent groups in environmental training;
- changes to mainstream programs to reflect growing community and industry concern with the impact of inappropriate work practices on the environment.

Chapter 4
Environmental training needs survey

The survey

A survey was developed and distributed to a variety of organisations concerned with environmental management. A copy of the survey can be found in appendix 4.

A total of 1490 questionnaires was dispatched, which became 1430 after subtracting returns to sender (60 RTS). The survey categories of organisations surveyed included:

- aerial aviation/spraying
- drilling/blasting
- drainers/effluent/sewerage
- fertilisers
- manufacturers
- abattoirs
- horticulturalists
- aquaculture/fisheries
- surveyors
- laboratories/pathology
- nurseries
- motor vehicle repairs
- funeral homes
- govt. departments
- farmers/graziers
- textiles
- petroleum/oil
- conservation
- developers
- asbestos removals
- engineering
- construction/project management
- environmental consultants
- foundries
- hospitals
- wineries
- tourism
- pest/weed control
- powder coaters
- professional associations
- shipping
- tanneries
- vegetable growers/orchards
- consultants
- mining exploration
- recycling/waste

The aim of the survey was to elicit information which would assist in determining TAFE's role in providing appropriate training in the 'environmental' field thereby addressing needs of a wide range of interest groups and individuals. The survey was also designed to assist in identifying programs or program components which need to be designed in order for TAFE to develop and provide the appropriate vocational training.

Return rates

Completed questionnaires were received from 298 organisations/individuals. This represented an approximate return rate of 21%. Throughout this report only valid percentages are stated, that is, blank or non-responses were ignored in calculating the percentages unless otherwise indicated.

Major activities of respondents

By far the most prevalent activity of those involved in this study was in the area of local government. This activity was identified by 18.8% of respondents. Manufacturing was the next major activity representing 5.7% of responses.

An outline of the major activities performed by organisations/individuals in this study are presented in Table 1.

Table 1 Major activity of organisations/individuals involved in the study

Major activity	No. of Co's	Major activity	No. of Co's
Local government	56	Environmental consultant	6
Manufacturing	17	State government department	6
Retail	16	Wastewater treatment/disposal	5
Heavy engineering/ building/construction	16	Natural resource management	5
Farming and grazing	13	Project management services	4
Pest/weed control and/or management	12	Scientific (analytical, diagnostic)	4
Professional association	12	Mineral/gas exploration/processing	4
Winemaking/grapegrowing	11	Water management/conservation	4
Recycling/waste processing	10	Aerial spraying	4
Health care/safety	9	Developers	3
Consulting engineer	8	Animal and plant control	3
Petroleum production/distribution	8	Abattoir	3
Fisheries	7	Demolition/earthmoving	3
Conservation/environmental protection	7	Education and training	2
Surveying	6	Local government association	2
Motor vehicle repairs/fuel retailer	6	Farming services	2
		Forestry	2
		Land management	2

Other areas of activity identified included (single responses):

- funeral director
- a resource centre
- fruit growing
- tanning
- providing free trees
- plumbing & gasfitting
- fire and incident prevention
- super spreading
- seismic surveys
- landfill
- building services maintenance
- salt production
- shipping
- milk processing
- volunteer management
- powder coating
- investigating rare earth plants

Unfortunately, poor (or in some cases nil) responses were received from organisations/individuals representing the following industries:

- chemical companies
- food manufacturers
- waste management
- foundries

- pharmaceutical companies
- paint manufacturers
- rubber and plastic manufacturers
- nurseries/landscapers
- smallgoods manufacturers
- shipping
- tanners
- funeral homes
- farmers
- abattoirs
- tourism
- market gardeners

While the response rate from government departments may seem low, many of the departments identified their actual activity rather than identifying themselves as a 'government department'.

Respondents

The majority (32.6%) of questionnaires were completed by those who identified themselves as either a manager or owner manager. Table 2 below presents a comprehensive breakdown of those who completed the survey. (Approximately 5% of respondents failed to identify their job title.)

Table 2 Job title of respondents who completed the survey

Job title	No. of replies	As a %	Job title	No. of replies	As a %
Manager/owner manager	97	32.6	Scientific	5	1.7
Executive positions	87	29.2	Administrative	16	5.4
Local government	30	10.1	Technical	15	5.0
Professional	25	8.4	Other (including para-professional)	7	2.4

Company size

Responses were received from organisations ranging in size from one to over 500 employees with the majority of organisations employing between one to five people. Table 3 below presents a breakdown of the sizes of the various companies involved in the study.

Table 3 Size of company involved in the study

Number of employees	Responses as a %	Number of employees	Responses as a %
1-5	34.3	50-99	7.2
6-9	9.4	100-499	11.6
10-19	17.0	500+	6.1
20-49	14.4		

Environmental compliance

When the following statement was posed to survey participants: 'Environmental management is increasingly becoming an issue, or

at least a component of many jobs. Is this true of your organisation?', the majority (95.8%) of respondents either strongly agreed or agreed with the statement. Only 1% disagreed with the statement. No respondent strongly disagreed and 3.1% had no opinion.

Therefore, it can be confidently concluded that environmental management is increasingly becoming an issue or at least a component of many jobs in South Australia (i.e. within the industry sectors surveyed).

In terms of legislation, just under two-thirds of respondents (67.8%) were aware of the South Australian Environment Protection Act of October 1993. The remainder, 35.8% were not aware of the legislation.

When asked what impact, if any, the legislation will have on their organisation, 42.2% of respondents stated that it will have an extremely strong or strong impact. Other respondents felt that it will have some impact (35.8%); 22% suggested that it would have only a slight impact or no impact at all.

Table 4 Environmental legislation respondents must comply with

Legislation	No. of responses	Legislation	No. of responses
• Waste Management Commission Act	54	• Occupational Health, Safety and Welfare Act	6
• Clean Air Act	44	• Fisheries Act	5
• Public and Environmental Health Act	36	• Agricultural Chemicals Act	5
• Native Vegetation Act	35	• Controlled Substances Act	4
• Development Act	35	• Site Contamination Act	4
• Water Resources Act	33	• Housing Improvement Act	4
• Environmental Protection Act	18	• Building Act	4
• Heritage Act/Aboriginal Heritage Act	18	• Planning Act	4
• Noise Control Act	16	• Wildlife Protection Act	4
• Local Government Act	14	• Country Fire Act	4
• Dangerous Substances Act	14	• Sewerage Act	3
• National Parks and Wildlife Conservation Act	14	• Mines and Works Inspection Act and Regulations	3
• Animal & Plant Control Act	13	• Pastoral Land Management and Conservation Act	3
• Marine Environmental Protection Act	12	• Petroleum Exploration Act	2
• Soil Conservation and Land Care Act	11	• Biological Control Act	2
• Coast Protection Act	10	• Harbours Act	1
• Mining Act	10	• Highways Act	1

This finding suggests that while most acknowledged the importance of the environment to them, relatively fewer were aware of significant new legislation in the area.
A plethora of acts have environmental components. Those which have the greatest impact on the organisations surveyed, as indicated by respondents, are presented in Table 4.

Surprisingly only six respondents indicated that their organisation is obliged to comply with the OHS and Welfare Act.

Political and social pressures

Respondents were also asked to indicate the extent to which social pressures (such as increased public support for policies and actions in the area of environmental management) impacted on their organisation. The majority of respondents indicated that such pressures were only having some or a slight impact on their organisation (51.7%), while 32.8% of respondents felt that such pressures were having either an extremely strong or strong impact on their organisation. The remainder (15.5%) indicated that such pressures were having no impact whatsoever.

When asked whether social/political pressures will impact on the number of people needed with environmental management skills in their organisation, the majority (53.3%) of respondents indicated that there would be no change in the number of people with such skills. About one-third (32.8%) of respondents stated that their organisation would need more people with such skills, while 4.2% indicated that their organisation would need many more people with environmental management skills. A small minority (8.7%) suggested that no such people would be needed, while very few (1%) stated that fewer people would be needed.

Organisations employing an environmental manager

Of those who responded to the question 'Does your organisation employ an environmental manager?', the overwhelming majority (86.3%) said that their organisation did not employ such a person. A small per cent (13.7%) stated that their organisation did.

Table 5 on the following page identifies the organisations who employ environmental managers. The table presents both the total number of survey returns from the particular sector and the number of organisations within the sector who identified that they employ an environmental manager.

Table 5 Number and type of organisation employing an environmental manager

Major activity	No. of Org's	No. with Env'tal manager	Major activity	No. of Org's	No. with Env'tal manager
Local government	56	11	Fisheries	7	1
Manufacturing	17	5	Professional association	11	1
Petroleum production/ distribution	8	4	Health care/safety	9	1
			Training and education	2	1
Mineral exploration/ processing	4	3	Water management/ conservation	4	1
Government departments	6	2	Land management	2	1
Heavy engineering/ construction	5	2	Conservation/ environmental protection	6	1
Natural resource management	5	2	Motor vehicle repair	5	1
	6	2	Consulting engineer	10	1
Environmental consultant					

Major tasks performed by environmental managers

The most common function performed by environmental managers as indicated by survey returns is in the area of legislative/legal responsibilities and/or compliances and ensuring that their organisations comply with company standards, due diligence and codes of best practice.

It is also the environmental manager's responsibility to prepare and implement environmental plans and provide other staff members with appropriate advice in the area.

Furthermore, the environmental manager has a role in training and educating other employees in environmental management and educating and informing the public.

Other tasks performed by environmental managers are dictated by the sector in which they are employed (i.e. pest control, natural resource management, mineral exploration). Major areas of responsibility include:

Environmental law/organisational compliance

- legislation, licences, regulations, compliance (n=11)
- preparation/implementation/review of environmental plans/policies (n=10)
- providing environmental management advice, strategic advice, developing innovative environmental practices (n=5)
- responsible care programs/due diligence/best practice (n=4)
- local government responsibilities (n=1)
- implementing/maintaining national company standards/corporate policy (n=1)

OH&S/disposal

- OH&S, public and environmental health (n=6)
- Safe work practices/public safety (n=3)
- Waste disposal/management/control, recycling, litter (n=2)
- Dangerous goods/substances, storage, maintenance, transport (n=1)
- Clean air control, air emissions (n=1)

Public relations/education

- Training and education (n=6)
- Liaising and advocating (n=6)
- Dealing with the media/providing information to the public and educating the public (n=5)

Water management

- Water/stormwater quality/surface water management (n=2)
- Wastewater facilities (n=1)
- Watercourse management plans (n=1)
- Aquaculture (n=1)

Natural resource management

- Natural resource management (n=3)
- Revegetation (n=2)
- Erosion control (n=1)
- Preventing land degradation (n=1)
- Horticulture (n=1)
- Flora/fauna surveys (n=1)

Technical/investigative functions

- Environmental impact assessments (n=6)
- Land use planning/management/development (n=5)
- Preparing/carrying out audits (n=4)
- Monitoring functions (n=4)
- Inspectorial/investigative functions (n=1)
- Noise control (n=1)
- Clean-up of contaminated sites (n=1)
- Environmental data base collection (n=1)

Other

- Environmental management (n=7)
- Land use planning/management/development (n=5)
- Management functions/staff supervision (n=3)
- Conservation/protection/environmental enhancement (n=3)
- Land drafts (n=1)
- Geoscientific advice (n=1)
- Environmental sustainable development (n=1)
- Co-ordination of volunteers (n=1)

- Funding (n=1)
- Consulting functions (n=1)

Who has the predominant environmental responsibility?

Of the organisations who do not employ an environmental manager, the person identified most frequently, by respondents, as having the predominant responsibility for ensuring that the organisation complies with environmental legislation and minimising environmental harm is the owner/manager and chief executive officer (under a variety of titles). In fact, this occupational group was identified by 71 owner/managers and a further 50 chief executive officers (i.e. director, CEO, managing director, general manager)

Table 6 Number of responses identifying person with predominant environmental responsibility

Person with predominant environmental responsibility	No.	Person with predominant environmental responsibility	No.
• Owner/manager	71	• Parks and gardens supervisor	2
• CEO	50	• Administrator	1
• Development/building/planning officers	20	• OH&S officer	1
• Environmental health officer	17	• Environmental audit committee	1
• Management	16	• Geologist	1
• Engineer	13	• Government department	1
• Works manager/supervisor	12	• Chief of division	1
• Town/district clerk	7	• Volunteers	1
• All staff	6	• Architect	1
• Council	5	• Occupational hygienist	1
• Safety officer	4	• Lab staff	1
• Officers (general)	4	• Chief pilot	1
• Executive officer	3	• Chairperson	1
• General inspector	3	• Project officer	1
• Co-ordinator	3	• Production	1
• Chemist	2	• Winemaker	1
• Consultant	2		

* NOTE: Responses do not equal 298, as respondents often identified more than one person with the environmental responsibility

A notable percentage of respondents (12.4%) indicated that there was no one person in their organisation with environmental responsibilities, while 9.4% of respondents did not reply to this question. A small percentage of respondents indicated that the question was not applicable to their organisation (4.4%).

From the findings one can conclude that owner/managers and those in executive positions tend to have the predominant environmental responsibility. These managers were involved in a number of activities including plant, area, site, production/manufacturing, factory, recreation, farm, operations, R&D, planning, property, project, laboratory, sales and service managers.

Major tasks people with environmental responsibility are required to perform

The tasks people with environmental responsibilities are asked to perform are broad and varied. Like the responsibilities of the environmental manager the two most common areas of responsibility include:

Environmental law/company compliance

- legislative/statutory compliance, legal requirements and meeting company standards/obligations in relation to environmental management (n=46)
- signing statutory declarations of environmental compliance/duty of care (n=2)
- ensuring consultants employed comply with current codes of practice (n=1)

Health and safety functions

- waste disposal/management/control/reduction/ monitoring/implementing safe waste management practices, recycling, dump maintenance/supervision (n=24)
- health, occupational health and safety, welfare, ensuring public safety (n=17)
- clean air/pollution control (n=9)
- chemical storage, handling, packaging, disposal (n=8)

The other areas of responsibility can be grouped into the following six broad categories:

Water management

- wastewater/stormwater treatment and discharge (n=6)
- effluent maintenance (n=4)
- coastal/marine protection (n=3)
- water conservation/supply, testing, sampling (n=4)
- minimising flooding (n=1)
- irrigation management plans (n=1)
- development of natural wetlands (n=1)

Natural resource management

- pest/plant management (pesticides, weedicides, herbicides), keeping up-to-date with all environmental chemicals and treatment methods, mixing, applying, storing and disposing of pesticides, correct application of pesticides, clean-up, recording applications, monitoring effects of applications (n=9)
- developing and implementing revegetation program, native vegetation clearance, roadside vegetation maintenance (n=5)
- erosion control (n=2)
- parks, gardens and recreation management (e.g. open space development, ponding, wetlands) (n=2)

- fire prevention (n=2)
- 'off-target' damage control (n=1)
- pasture and stock management (n=1)
- natural resource management (n=1)

Technical/investigative functions

- monitoring functions (n=7)
- investigative functions (n=7)
- recording practices/report preparation (n=5)
- audits/monitoring/assessment, hazard identification/analysis (n=4)
- keeping up to date with new technical data/research, carrying out research (n=4)
- identification/clean-up of contaminated land, site remediation (n=3)
- workplace incident monitoring/reporting (n=2)
- assessment of noise pollution (n=2)
- field work (n=2)
- emptying silt traps (n=1)
- aerial dispersant application operations for marine oil spills (n=1)
- supervision of machinery & dust extractors (n=1)
- interpreting land use capability principles (n=1)
- maintaining asbestos registers (n=1)
- undertaking site audits (n=1)

Building/planning functions

- building/planning/development (n=6)
- building maintenance, energy management/conservation, plant operation (n=2)

Public relations/education

- liaising, consulting, advocating, lobbying (n=7)
- training and education, program/course development, public relations, promoting public awareness (n=6)

Other

- management functions, administrative operations, staff supervision (n=11)
- creating better environmental conditions, conservation, protection (n=9)
- development of environmental strategies, innovative environmental practices and techniques (n=6)
- general environmental/awareness of environmental issues (n=3)

A comparison of the functions performed by environmental managers and those who have been allocated environmental responsibilities within an organisation shows that even though the tasks can be grouped into similar headings, the responsibilities of the environmental manager are particularly focussed in the area of

preparing environmental plans, codes of best practice, due diligence and so on.

There are however three particular common areas of responsibility. These area:

- legislative/statutory compliance
- OH&S
- training and education

While environmental managers do perform technical functions, it seems that those who are assigned environmental responsibilities within organisations (i.e. not environmental managers) perform a broader range of technical and investigative functions related to the environment.

Environmental roles and training needs

In the earlier part of this chapter we explored the areas of responsibility and associated tasks those with environmental management responsibilities are required to perform within their organisations.

This section of the chapter explores the training needs of any other employees who may have an environmental role within their organisation. Respondents to the survey were asked to state what roles such employees have, what specific types of training they may require and how many employees require the identified training.

Throughout, the following subheadings (i.e. managerial, professional, administrative, technical and operative), are used to provide a summary of the major training needs of all respondents in that group. As well as the general summaries, the training needs of a number of specific organisational sectors are also provided, with a particular focus on local government training needs, given that this was the most prevalent activity of those involved in the study.

Managerial training needs

One of the major occupational groups requiring training in the area of environmental management are managers, as indicated by survey returns.

All organisational sectors

The overwhelming training need of this particular group was in the relation to general legislative responsibilities and environmental awareness. For example relating to:

- various Act compliance

- EPA legislation
- environmental law

Keeping up to date with new legislation was a training need expressed by respondents in the retail area, the engineering/building/construction sector (i.e. environmental issues and responsibilities, legislation), the pest control sector and by those in the area of petroleum production/distribution.

Local government

In terms of training for managers in local government the predominant two training needs were in relation to:

- responsibilities of councils under various acts
- general overview of legislation impacting on local government

Manufacturing

Once again training in the area of Act compliance was a need identified by those in the manufacturing sector, as was training in waste and dangerous substance management.

Winemaking/grapegrowing

Respondents whose main activity was identified as winemaking/grapegrowing also suggested a need for training in the area of act awareness and its implication. These respondents also highlighted training needs in waste control and specific technical skills.

Professional associations

Training needs of those involved in professional associations were slightly broader than those of the managers above. Training needs include the following:

- environmental law
- technical skills
- staff management
- problem-solving

Professional training needs

It seems from survey returns that respondents felt that those employed in professional positions are a target group for environmental management training.

All organisational groups

As a whole, the environmental training needs of professionals were the most difficult in terms of identifying common areas of environmental training. The responses were quite varied among industry sectors and indeed within individual sectors. Unlike the

other occupational groups, it was far more difficult to generalise and categorise this group's training needs.

Nevertheless, it did seem that one of the greatest areas of needs is in the area of technical training (e.g. water sampling, chemical usage, pest control, vegetation identification etc.).

Other needs expressed included:

- act interpretation
- legislative responsibilities
- general environmental issues
- environmental management generally

Local government

The training needs of professionals in local government, as indicated by respondents, seems to be far broader than that of the managerial group. Training needs identified include environmental awareness relating to works and services. For example in specific areas such as:

- pest control
- hazardous chemicals
- coastal management

and, of course, training in relation to legislation and regulations.

Manufacturing

Survey results also indicated that professionals in the manufacturing sector also need environmental training relating to their specific areas of responsibility; that is, in areas which affect their daily operations.

Engineering/building/construction

Similarly professionals in the engineering/building/construction sector also identified a need for training in specific areas of responsibility (e.g. risk assessment, contaminated land).

Winemaking/grapegrowing and health care

A number of industry sectors also identified the need for more technical training for professionals. Respondents from the winemaking/grapegrowing sector indicated a need for training in winery waste and chemical usage. Similar areas of need (i.e. waste management and chemicals) were also identified by those in the health care sector.

Petroleum production/distribution

Respondents from the petroleum production/distribution and mineral exploration sectors identified a need for training in the more physical skill areas. Areas such as manual exploration to

minimise disturbances, physical environmental management, environmental technologies and techniques were suggested.

Administrative training needs

The smallest group needing training in the environmental area are those employed in administrative positions. Notwithstanding this, respondents suggested that a general overview of legislation and the environment would be beneficial for this occupational group. Training needs identified included:

- report preparation
- technical training
- policy and procedures
- information management/access

Technical training needs

A general summary of training needs across all the industry sectors shows that as well as an overwhelming need for training in relation to new legislation and environmental law, there is also a need for technical training which relates to the environment. For example:

- instrument operation
- water monitoring
- soil testing
- environmental technology

Many of these needs may be met by modules in the national Scitech project funded by ACTRAC.

Local government

Respondents emphasised in their returns that any environmental training directed at technical employees must be specific to their daily operations/tasks. For example, in the area of local government, environmental training for technicians could include measurement techniques, water sampling, waste disposal/management. Furthermore, broad, on-going environmental awareness training was also seen as being necessary.

Manufacturing and engineering/building/construction

Respondents from both the manufacturing and engineering/building/construction sectors suggested that there is a need for environmental training which incorporates daily operating procedures and specific work areas (e.g. environmental legislation issues relating to daily tasks performed within the manufacturing sector).

Operative training needs

Once again environmental training needs for operatives, as suggested by respondents, is in the area of environmental management as it relates to daily operating procedures. It involves carrying out tasks in an environmentally friendly manner

Legislative responsibilities, and a general familiarity with environmental acts (impacting on daily tasks) were also stressed as important areas of training.

Other training needs suggested by respondents included:

- evidence gathering
- problem resolution
- geology
- investigative methods
- Aboriginal liaison
- waste/dangerous substances disposal

Responses to these questions are provided in full in appendix 5. The appendix lists the organisation's main activity, employee role, employee training need and the numbers requiring training.

Who, when, by whom and where?

While the environmental training needs survey explored *possible* training needs within organisations, it also sought to determine *actual* training needs and to ascertain which organisations would be more likely to access environmental training, when, how, by whom and where?

The total sample size for this particular section of the survey was relatively small. Caution must therefore be exercised when interpreting the findings. Nevertheless, the data obtained are important in that they highlight trends within occupational groups and within particular industry sectors.

An analysis of the data does provide a general picture of the preferred time, length, outcome of training and so on, thereby allowing for a initial and general picture to be obtained.

Management

An analysis of the 68 responses relating to actual managerial training needs shows that persons employed as managers prefer training courses to be delivered during the day (n=47).

When asked to specify the level of environmental training or the desired outcome of training, the majority of respondents favoured non-award courses (n=33). Only nine respondents stated that they

would expect an award/certificate on the completion of training. Almost 5% of respondents to this question had no opinion.

The preferred length of training suggested by respondents was no more than fourteen days, with the majority (n=45) preferring training courses of between half a day to three days in length. Other preferences included:

- 1-2 weeks (n=6)
- flexible or varying needs (n=5)
- no opinion (n=10)

The preferred training providers for managers were:

TAFE	(n=17)	TAFE/PEP	(n=2)
private provider (PEP)	(n=13)	TAFE/other	(n=5)
inhouse training (i.e. training provided by the organisation for itself	(n=6)	PEP/other	(n=3)
		other	(n=9)
uni/TAFE	(n=5)		
LGTA (Local Govt Training Authority	(n=3)		

Local government

An analysis of the 17 responses to actual training needs of managers employed in local government shows that a common area in which training is needed is in relation to environmental legislation and principles of environmental management (i.e. legal and general overview).

Most local government respondents (n=12) indicated that they would prefer training to be held during the day and more than half (n=9) indicated that an award was not necessary after the completion of training. Only two respondents indicated that they would expect an award/certificate, while five did not respond to the question.

Preferred training providers for managers in local government were:

TAFE	(n=3)	TAFE/PEP	(n=2)
LGTA	(n=3)	uni/TAFE	(n=2)
PEP	(n=2)	flexible	(n=2)
other	(n=3)		

The majority (n=10) of respondents suggested that training should be between one to three days in duration. Only three suggested courses of between one to two weeks.

Manufacturing

In the area of manufacturing, respondents suggested that legal responsibilities, act compliance and waste management are common areas in which training is required.

Once again responses (n=8) indicated that training during the day was the preferred option (n=5) and the training outcomes suggested were:

non-award	(n=3)	no response	(n=2)
certificate	(n=3)		

In terms of length, all but one of respondents from the manufacturing sector (who responded to this question) indicated that training should be between half a day to two days in duration, with the preferred training provider being TAFE (n=4) and training being delivered on site (n=6).

Engineering/building/construction

Responses from the engineering/building/construction sector indicated that training needs to be provided in relation to environmental Acts/regulations.

Once again responses (n=5) indicated that day courses were the preferred option (n=4). The level of training was (on the whole) not specified.

The preferred length of training suggested by respondents in this sector was between half a day to one day, with one respondent suggesting a course of between one and two weeks.

The preferred training provider by this sector was varied:

private provider	(n=2)	TAFE/inhouse	(n=1)
external	(n=1)	TAFE	(n=1)

Petroleum production/distribution

Respondents from the petroleum production/distribution sector also identified a need for training in legislative awareness and regulatory requirements.

A summary of the responses from this sector (n=5) shows that day courses were the preferred option (n=4), as were non-award courses (n=4). Respondents also favoured courses of one day in duration presented by:

private provider	(n=2)	inhouse	(n=1)
TAFE	(n=1)	no response	(n=1)

Professional associations

Respondents from professional associations indicated a need for training in such areas as parks management, time management and technical training.

Respondents (n=4) were divided in terms of when the training should be provided, with a even balance between day (n=2) and evening (n=2) courses.

All respondents (n=4) felt that the training should be provided by TAFE.

Professionals

While respondents from this occupational group (n=39) generally favoured training conducted during the day (n=25), a number (n=6) indicated that they were flexible in this respect, while five respondents preferred evening classes.

In terms of preferred level of training, survey returns showed the following:

non-award	(n=23)	flexible	(n=2)
certificate/award	(n=11)	no response	(n=7)
post-grad/dip	(n=3)		

While the preferred length of training was between half a day to three days (n=23), a preference was also shown for longer courses. For example:

1-2 weeks	(n=8)	1-2 years	(n=2)
1-6 months	(n=7)		

The preferred training providers were:

TAFE	(n=10)	flex/varying	(n=3)
uni/TAFE	(n=9)	other	(n=9)
private provider	(n=4)		
university	(n=3)		

Local government

With respect to specific sectors, respondents from local government (n=15) suggested (amongst other things) a need for training for professionals in the areas of:

- legislative awareness
- qualifications update
- specific area training

In terms of when the training should be provided most (n=8) respondents indicated a preference for day time training. However, a number (n=6) also suggested that they were flexible in this respect.

Once again, there was a predominant preference for courses of between one to five days (n=9), conducted by either a university or TAFE.

Engineering/building/construction

Within the engineering/building/construction sector, preference was shown for environmental training specifically related to the industry (i.e. roadworks, technical training).

Respondents (n=5) showed a preference for non-award training for professionals (n=3) of between half and two days in duration (n=5), conducted by either TAFE (n=2), inhouse (n=2), uni/TAFE (n=1) or by a private provider (n=1).

Administrative

Respondents to the survey generally suggested that training for employees in administrative positions should include topics such as environmental legislation, policy and environmental acts and their implications.

It is important to note however that there were fewer respondents (n=14) to the training needs of administrators than to the other occupational groups.

Once again day time, non-award training (n=8) was the preferred option for this group, as was training of between half a day to five days (n=10) (average was between one to two days), provided by:

private provider	(n=3)	uni/TAFE	(n=1)
inhouse	(n=3)	industry/uni	(n=1)
TAFE	(n=1)	TAFE/uni/	
TAFE/PEP	(n=1)	inhouse	(n=1)

Technical

A general analysis and summary of responses (n=35) for technical training showed a preference for non-award (n=16), day time training (n=26) of between one to five days in duration (n=21). The preferred training provider for this group was TAFE (n=13), with a number of other respondents indicating a preference for TAFE/PEP (n=3), uni (n=2), TAFE/inhouse (n=2), uni/TAFE (n=1), TAFE/PEP/inhouse (n=1), other (n=6).

Survey returns showed a preference for training in environmental awareness/issues and legislation for technical employees in local government. Other training needs included noise control, water quality and stormwater management.

Local government

Of the 16 responses from local government, 13 respondents preferred training during the day. (Three were flexible.) Courses of between one and five days (n=10) were suggested with a mix of

certificate (n=5) and non-awards (n=8) being suggested as the training outcomes.

Operatives

Operative training needs in the area of environmental management (as suggested by survey returns) tends to be in the area of:

- pest control
- legislation
- environmental awareness
- vegetation

An analysis of responses for this occupational group (n=52) shows that the preferred time for training for operatives is during the day (n=41), and the desired length of training expressed by respondents is between one to five days (n=40).

While the preference for training provider is TAFE (n=25), several respondents also indicated a preference for:

inhouse training	(n=5)	inhouse/TAFE	(n=2)
private provider	(n=4)	external	(n=2)
TAFE/PEP	(n=3)	other	(n=6)

Local government

In terms of specific industry sectors, common areas of training for operatives in local government are in relation to:

- pest control
- vegetation

Of the 11 respondents, 10 indicated a preference for day time training. A breakdown of responses relating to preferred training provider shows the following:

TAFE	(n=4)	LGTA/TAFE	(n=1)
flexible	(n=2)	TAFE/PEP	(n=1)
inhouse	(n=1)		
LGTA	(n=1)		

Courses of between one to five days was also suggested (n=9).

Engineering/building/construction

Training needs for operatives employed in the engineering/building/construction sector fall in the area of environmental awareness and specific environmental training as it relates to the industry.

Responses (n=5) indicated that day time training (n=4) of between half a day and two days duration (n=5) was specified as was

training provided by private training providers (n=2), inhouse (n-2) and on-site (n=4).

Pest/weed control

Respondents from the pest/weed control sector (n=7) showed a preference for day time training (n=4) with a half of the respondents suggesting that a certificate/award (n=3) be presented on completion of the training and the other half indicating that no award (n=3) was necessary. The preferred duration of training suggested was between one to two days (n=4), conducted by TAFE (n=6) and on-site (n=5).

Mineral exploration

Operatives employed in the mineral exploration sector tend to have industry-specific and technical training needs (e.g. rehabilitation, minimising environmental disturbances, pollution control, Aboriginal heritage). Day time (n=4), non-award (n=3) training is preferred for this employee group, as is training lasting between one to two days conducted by either a private education provider or TAFE.

A full outline of survey responses can be found in appendix 6.

In summary . . .

On the whole, survey returns tend to suggest that the most common environmental training needs of the five occupational groups are as follows:

Managerial

- general legislative responsibilities
- environmental awareness

Professional

- environmental awareness relating to works and services
- legislative requirements/regulations

Administrative

- legislative overview
- report preparation
- policy and procedures

Technical

- environmental training specific to daily operations/tasks
- technical training

Operative

- environmental management relating to daily operating procedures
- legislative responsibilities
- familiarity with environmental acts

In relation to when training is required, by whom, where and when, the returns tend to suggest that those in management positions tend to prefer:

- day delivery
- non-award courses
- short courses of between half to three days in duration
- training provided by either TAFE or private provider

Those in professional positions preferred the following options:

- day delivery
- predominantly non-award courses
- short courses of between half to three days in duration
- training provided by either TAFE or a university

The most common pattern which emerged for those in administrative positions is as follows:

- non-award courses
- short course of between half to five days in duration
- training provided by private education provider or inhouse

Survey returns tended to show that the preferred training options for those in technical positions is:

- day delivery
- non-award courses
- short courses of between one to five days in duration
- training provided by TAFE

The training needs of the final occupational group, that is the operative were as follows:

- day delivery
- non-award
- short courses of between 1 to 5 days in duration
- training provided by TAFE

The patterns which emerge are very similar throughout all of the occupational groups. That is, all prefer courses to be delivered during the day, all have a predominant preference for non-award short courses. The only significant difference which emerges is in terms of who should provide the training.

Training providers

Respondents were asked to identify the most appropriate training provider in environmental management. Survey participants indicated that the most appropriate environmental management training provider for people in management positions are the private providers followed very closely by TAFE. This differs significantly from the graduate survey results, which showed that graduates felt that universities were the most appropriate providers.

The most appropriate trainer for professionals was seen to be the universities. Graduate survey results showed the same preference.

TAFE was seen to be the most appropriate training provider in terms of environmental training for those in administrative positions. This was followed very closely by inhouse training. Graduate surveys showed the same preference.

TAFE was overwhelmingly the most popular choice for providing environmental management training for those in technical positions, while inhouse training was the preferred option for operatives.

Table 7 Number of responses in relation to preferred environmental training provider by occupational group

	Uni	TAFE	Private provider	Inhouse	LGTA
Management	63	78	80	76	7
Professionals	81	71	49	61	4
Administrative	23	76	45	75	6
Technical	24	106	43	77	2
Operative	6	81	35	106	3

The above table shows the number of respondents indicating which training provider they believed to be the most appropriate for providing training in the area of environmental management to the employee groups listed.

In summary:

- The major training providers for environmental training are seen to be inhouse or TAFE.
- Private providers are (narrowly) the preferred provider of training for management staff, although TAFE, private providers and inhouse programs are almost equal.
- University (followed by TAFE) is the preferred trainer for professionals.
- TAFE is the preferred provider for those in administrative positions and (in particular) technical staff. However it also has potentially strong support across the board, in particular in relation to managerial, professional and operative programs.
- Inhouse training is a strongly supported mode across the board, but it is particularly strong for administrative and operative training.

Respondents were also asked to indicate whether they were currently using the services of an education provider for environmental management training and, if so, how satisfied were they with this training.

Table 8 Number of responses in relation to satisfaction with environmental management training provider

Provider	Extremely satisfied	Very satisfied	Satisfied	Not satisfied	Not at all satisfied	Not applicable/ don't use
University	5	5	6	1		16
TAFE	6	9	20	2	2	15
Private provider	2	10	16			15

This table shows that while TAFE is the most frequently used (39 responses), it is one that offers least satisfaction. Although 90% at least are satisfied with TAFE as a provider, TAFE has the lowest percentage of extremely and very satisfied ratings and the highest not satisfied/not at all satisfied responses. Nevertheless, the sample is small and there may be biases introduced by the sampling process or those responding.

Access to TAFE

When asked whether workers in their organisation can conveniently access a TAFE centre, 83.3% of respondents indicated that they could, while 16.7% indicated that there was not a centre conveniently located near their organisation. The remainder either did not respond to the question or indicated that it was not applicable.

Those who cannot access a TAFE centre conveniently were asked to state what sort of training delivery would be most suitable for workers within their organisation. The following were some of the suggestions received:

- *One-off courses so country people can come to the city, correspondence courses, seminars in conjunction with AIBS*
- *Correspondence* (Booborowie)
- *On the job, video* (Beachport)
- *Institute/associations* (Wallaroo)
- *Inhouse training, regional training sessions* (Streaky Bay)
- *Any that would require least need to travel for staff* (Kangaroo Island)
- *Presentation inhouse by TAFE teacher, video, worknotes (the delivered material must be specific)*
- *Correspondence course* (Orrorro)
- *On-site* (Mt Compass)
- *Not during normal working hours because there is no nearby TAFE centre, TAFE is OK for after hours training as most employees associated with this aspect of work reside outside of the council area and closer to TAFE centre* (Ridley-Truro)
- *Inhouse* (Burra)
- *On-site with visiting trainer* (Lameroo)

- *On-site, regional* (Coonawarra)
- *None*
- *Correspondence*
- *Face to face is the best option for us. Other deliveries/options don't work for us*
- *External courses*
- *Participative 2-3 day modules, preferably in a live-in situation*
- *Broken shifts make training very difficult*
- *Lecture room facilities are available*
- *Infield seminars*
- *Correspondence* (Saddleworth)
- *Correspondence* (Robe)
- *Inhouse* (Saddleworth/Auburn)
- *Group seminar/workshops with other industry people from this region* (Franklin Harbour)
- *On-site education* (Elliston)

TAFE's strong flexible delivery infrastructure would enable it to meet the requirements outlined above.

A number of respondents who indicated that workers in their organisation could access a TAFE centre conveniently also made a number of comments with respect to more suitable training delivery options. These included:

- *Video, written courses, pamphlets*
- *After hours only, too busy during normal working hours*
- *Structured internal courses in conjunction with TAFE or private supplier*
- *Seminars*
- *For TAFE lecturers to visit employment precinct*
- *Inhouse* (n=7)
- *Video conferencing*
- *On-the-job* (n=2)
- *Video*
- *Correspondence*
- *Other venue (e.g. school, hotel venue or office)*
- *Day course*
- *Talks and hands-on practice*
- *Must be after hours*
- *Short after hours training sessions*
- *On-site/videos*
- *Short courses also very useful*
- *3-5 days in one hit at appropriate college*
- *Correspondence and video*
- *Visiting lecturers for regional areas*
- *Access to regional training with other councils*
- *Distance education, inhouse*
- *On farm or field days*
- *Yes—but not interested*

Other comments made with respect to access to a TAFE centre included:

- *The level and standard of training required is practically and operationally experienced based [sic] and I do not think is in TAFE 'area of influence'. Worldwide this is a very small industry and R&D is generally conducted by leading companies or government funded research* (Aerial marine oil spill control)
- *We organise the courses and ask TAFE or SARITC to bring the trainers to Kangaroo Island*
- *We are a Statewide organisation, some employees have access, others do not*
- *80km distance, reasonably convenient* (Meningie)
- *Not answered because ours is a diverse (Aust. wide) organisation with a wide variety of needs/expertise. We are training providers but we also recognise that we need training too*
- *Some can, some can't, depending on remoteness of site—inhouse training would be most suitable* (e.g. Gillman, Leigh Creek, Hawker)
- *It depends where they live—correspondence courses, with supporting local practical workshops*
- *Access dependent on location chosen. Video presentation packages could be included under existing Site Training Program*

Organisations employing the services of consultants

When asked if their organisation employs the services of an outside body to provide advice in the area of environmental management, almost one-third (31.9%) of respondents indicated that their organisation does, while the majority (68.1%) do not.

The organisations who do use the service of consultants do so to obtain the following advice:

- environmental law (n=33)
- planning (n=14)
- site contamination (n=10)
- health (n=7)
- regulatory compliance (n=7)
- environmental auditing (n=5)
- botany (n=4)
- pollution control (n=4)
- stormwater (n=3)
- environmental management (n=3)
- land management (n=3)
- revegetation (n=3)

Other areas in which advice is sought include:

Water management

- water quality assessment
- groundwater management
- irrigation management
- water contamination
- hydrology

Waste management

- recycling
- hazardous substance disposal
- landfill management

Natural resource management

- horticulture
- weed control
- fire management
- flora & fauna
- reserve management
- ecotourism
- native vegetation management
- farm practices
- environmental protection/conservation

Health and safety

- radiation and safety
- chemical hazards

Organisations employing the services of volunteers

Respondents who use the services of volunteers identified their main area of activity as:

- farming and grazing
- professional associations
- healthcare/safety
- petroleum production/ distribution
- training and education
- natural resource management
- government department
- retail
- manufacturing
- fisheries
- local government
- volunteer management
- resource centre
- fire prevention
- farming services
- forestry
- scientific
- consultant

When respondents in this study were asked if they use the services of volunteers, the great majority (77.9%) did not. Only 22.1% stated that they did.

Of those who stated that they did employ the services of volunteers, two-thirds (65.6%) agreed that it was important that volunteers be trained in the area of environmental management. Significantly fewer (15.6%) respondents stated that it was either not very or not at all important and 18.8% indicated that they were of neutral opinion.

Training of volunteers

In terms of supporting the training, only 4.8% of respondents, who use the services of volunteers, indicated that they would support such training to a great extent, 31.7% indicated that they would be

in a position to support it to some extent, while the majority (52.4%) stated that they would only support it to a very small extent or not at all.

A point of interest arising from an analysis of training for volunteers shows that the majority of respondents who indicated that training for volunteers is either very important or important also indicated that they were only willing to support the training to a small or very small extent.

Respondents who use the services of volunteers provided a brief outline of the types of tasks volunteers undertake. Respondents were also asked to specify any training needs these volunteers may have.

The tasks performed by volunteers are broad, covering a variety of different areas. A general summary of the roles can be divided into the following headings:

Natural resource management

- landcare (n=4)
- tree planting/management/propagation (n=3)
- roadside/reserve vegetation (n=3)
- fire protection/fighting (n=3)
- roadside seed collecting (n=2)
- weed eradication
- feral animal eradication
- reserve management
- habitat management
- raising/planting seedlings
- 'greening'

Administration

- computing (n=3)
- secretarial (n=2)
- organising seminars (n=2)
- advisory functions
- interviewing
- fundraising
- co-ordinating
- library functions

Technical functions

- water sampling
- data collection
- fauna/flora ID

Water management

- coastal planning/reclamation
- water management

Pollution control

- clean up (n=2)
- KESAB

Planning and development

- townscape
- planning

Other

- labour force environment and repair
- labour force survey
- caretakers
- bus drivers
- manufacturing/packaging
- kiosk operators

Regardless of whether respondents were willing to support the training of their volunteers, they did identify a number of important training needs. The greatest training need of volunteers

seems to fall into the natural resource management category. Areas in which training is needed included:

- flora/fauna ID (n=4)
- land management (n=3)
- erosion (n=3)
- tree planting (n=2)
- weed control (inc. hand control) (n=2)
- coastal care/ management (n=2)
- landcare
- herbicides
- soil management
- horticulture
- roadside vegetation
- seed collecting
- direct seeding

Other areas in which training is needed included health and safety (n=2), chemical safety, safe work procedures (inc. disposal, handling, packaging).

Technical skill training is another important area for volunteers. It is both important and necessary for groups of volunteers to possess skills in survey methods, mapping, biological surveys and chainsaw use.

It is also necessary for certain volunteers to possess administrative skills; for example skills in seminar management, data base understanding and operation, dissemination of information and the ability to plan strategically and forward plan.

Other training needs identified included recycling (n=2), volunteer supervision and emergency response.

Survey responses in relation to the training needs of volunteers and their role are presented in appendix 7.

Training issues

Respondents were asked to indicate what priority environmental training is given in their organisation. Their responses are presented in the Table 9 on the following page.

Table 9 Priority given to environmental management training within organisations surveyed (as a %)

Training priority	Responses (%)
Top five	37.4%
5-9	24.4%
10-14	14.2%
15-19	6.7%
Not in top 20	17.3%

On-the-job training

When asked if their organisation provides any inhouse environmental training, 26.3% of respondents indicated that their organisation did. The majority, 73.7% indicated that their organisation did not provide this kind of training.

Respondents who provide on-the-job training in relation to environmental issues have had their main area of activity identified in Table 10 below.

Table 10 Number of organisations who provide their employees with on-the-job environmental training

Main activity	On-the-job training	No. responded	Main activity	On-the-job training	No. responded
• Local government	3	56	• Environmental consultant	2	6
• Manufacturing	6	17	• State govt. department	3	6
• Retail	3	16	• Natural resource management	2	5
• Engineering/building/ construction	3	16	• Mineral/gas exploration/ processing	3	4
• Pest/weed control and/or management	4	12	• Water management/ conservation	1	4
• Professional association	2	12	• Aerial spraying	1	4
• Recycling/waste processing	4	10	• Developers	1	3
• Health care/safety	3	9	• Animal & plant control	1	3
• Consulting engineer	1	8	• Abattoir	1	3
• Petroleum production/ distribution	5	8	• Land management	1	
• Fisheries	1	7	• Resource centre	1	1
• Conservation/ environmental protection	2	7	• Fire & incident prevention	1	1
• Motor vehicle repairs/fuel retailer	1	6	• Powder coating	1	1
			• Providing free trees	1	1

Even though the numbers response rate is small, it can be concluded that as a proportion of responses, very few employers from local government, manufacturing, retail, engineering/ building/ construction sectors provide their employees with environmental training.

Again, as a proportion of responses, it seems that the petroleum production/distribution and mineral/gas exploration/processing sectors do incorporate environmental issues into their on-the-job training programs.

This could be attributed to the nature, environmental sensitivity, and size of the industries involved since organisations involved in petroleum production/distribution, and mineral exploration, tend

to be larger companies, whose training plans are developed by their head offices for national delivery.
In terms of local government one respondent stated that:

> *Council is at present addressing the training needs of employees in all fields. After completion of a training analysis by the LGTA the council is now looking at the development of a training policy and plan. Environmental management is important but is only one segment of training required. It does however rank high in priority of training needed.*

In terms of on-the-job environmental training provided by organisations, the most common areas which form part of the environmental training programs include:

- environmental awareness (n=13)
- legislative/legal compliance (n=11)
- OH&S issues (n=9)
- waste minimisation/recycling (n=9)
- hazardous substances/chemicals (n=4)
- environmental management (n=3)
- pest/weed control (n=3)
- keeping up to date, latest initiatives (n=3)

Other areas which make up environmental training programs included:

Technical training

- auditing
- technical procedures
- asbestos handling
- analytical interpretation
- rehabilitation techniques
- minimising ground disturbances
- risk assessment
- operational requirements
- pollution control

Natural resource management

- landcare
- sustainable farming
- tree planting
- natural resource management competencies
- conservation
- native vegetation
- seed collection

Water, air, energy management

- water and energy consumption
- water management
- marine pollution
- pollution control
- air quality
- noise control/assessment

Other

- ESD
- project management
- environmental induction
- geographic info systems
- environmental systems
- benchmarking

- team leadership
- environmental research
- community involvement

A complete breakdown of responses regarding inhouse training, level of staff trained and how the training is provided by employers is presented in appendix 8.

When asked to describe how environmental training is provided, a number of respondents merely stated 'inhouse' or 'on the job'. While this did not provide any substantial information a number did specify the type of training provided in more detail. These responses are indicated in Table 11 below:

Table 11 How environmental training is provided by organisations to their employees

Training provided	No. of responses	Training provided	No. of responses
1hr-5hr training courses	19	Meetings (inc. informal meetings)	3
Ongoing/continuous training	8	2-10 day live-in/ residential	3
1-3 day training courses	8	Videos	2
Seminars/conferences	4		
Short courses	4		
Induction training	4		

It also seems, from survey returns, that much of what is called 'on-the-job' training is in reality an informal information-sharing process. As indicated in a number of survey returns 'on-the-job' training consists of informal discussions, informal meetings, newsletters and publications.

A number of organisations also include environmental training as part of their general induction process for new recruits.

Of those who do provide a more structured training program, it seems that on average, the training is between ½ to two days in duration.

Environmental information

Pamphlets were the most common method of obtaining environmental information (n=165). Two other common ways of obtaining such information is:

- on the job (n=157)
- word of mouth (n=155)

Other methods identified included:

- short courses (n=76)
- video (n=38)
- formal award (n=30)

Less frequent ways identified by respondents were:

- technical publications
- magazines
- newsletters
- professional association
- journals
- television
- newspapers
- industry networks
- notice board
- contract documents
- policy papers

Comments and additional information

In addition to answering the set questions provided in the survey, several respondents also provided a number of additional comments.

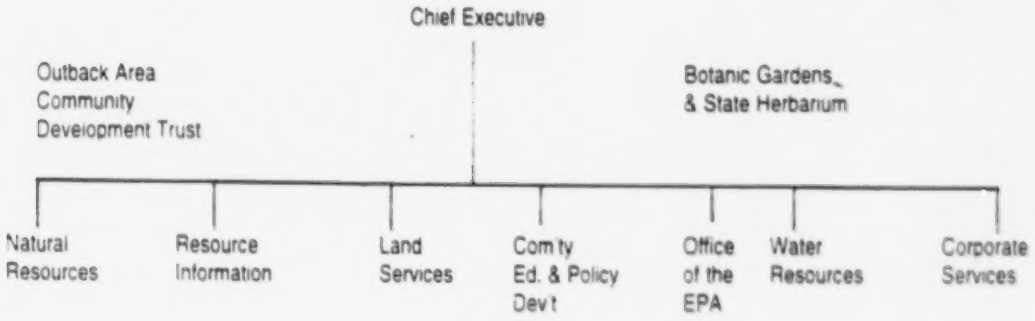
A variety of comments were made in relation to how difficult it is for some organisations (particularly the larger ones) to specify their environmental training requirements.

> *It is very difficult to specify training requirements as the variety of individual needs plus departmental needs are very large and complex. Our operatives alone needs stacks of ongoing training. There is definitely a need.* (Natural resource management)

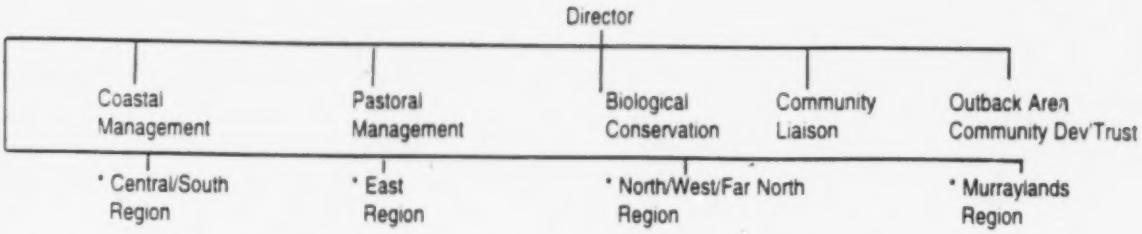
Organisational charts provided by the Department of Environment and Natural Resources (DENR) shows that the Department is in a period of transition with changes to various sections taking place (amalgamations).

The following organisational charts show the vast nature of the Department.

Department of Environment and Natural Resources
Organisational structure, March 1994

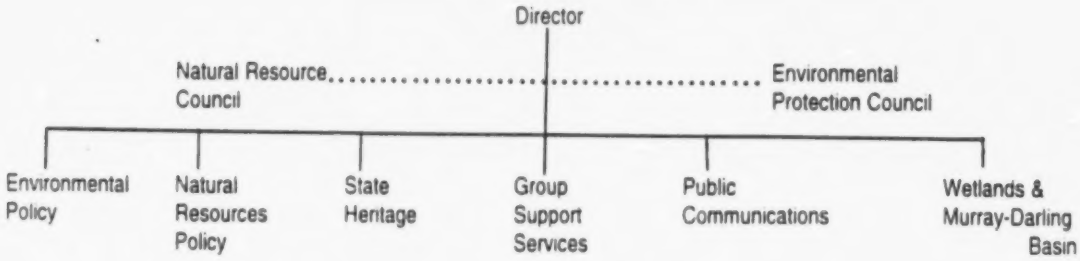


Natural Resources Group



* National Parks and Wildlife
# Valuation services, business services, planning and property services have not been included in the above chart.

Community Education and Policy Department Groups



Office of the Environmental Protection Authority

While the various branches of the Office of the EPA (as outlined in the above chart) have numerous responsibilities, the following are those with a direct environmental focus (as opposed to administrative etc).

Policy and planning branch

- EPA legislation and policies
- co-ordination of development applications
- strategic planning and evaluation

Water and monitoring branch

- licensing and negotiating of environmental improvement programs for wastewater treatment plants
- development of policies and practices for improved water quality
- marine pollution control
- environment quality goals

- ambient air and water quality monitoring
- emergency and oil spill responses

Industry services branch

- licensing and negotiation of environmental improvement programs for manufacturing and other industries
- cleaner production program
- contaminated sites program
- motor vehicle emission reduction program
- phase-out of ozone depleting substances
- air and noise emission control

Recycling and waste branch

- licensing and negotiation of environmental improvement programs for waste management industries
- securing repository for hazardous waste
- industrial and domestic recycling
- collection/disposal hazardous chemicals
- solid waste management strategies
- inspection and enforcement

Administrative services

- staff training and development
- integrated computerised data base with licences, inspection reports, complaints, monitoring reports

The office also has a number of principal advisers in the areas of noise control, ozone protection, marine, water quality, aquatic biology, solid waste, recycling, groundwater pollution, hazardous waste, emergency response and development assessment.

Other comments in relation to the difficulty of identifying training needs included:

- *Hard to define training needs. Range covers the whole area of legislative requirements, one-off requirements and ongoing training as applicable. Short courses are very useful.* (Winemaking)

- *Our department totalling some 2800 employees is responsible for many activities requiring some form of environmental understanding and hence training. These roles range over a very wide spectrum, from design of a new major facility to maintaining reservoir reserves, repairing burst water mains etc. The approach that is being taken is to ensure that all employees have some degree of environmental understanding through training instruction. In some areas, such training will involve tertiary study—environmental law—through the whole range down to ensure that one's workplace meets required standards. Thus it is a very complex problem for a central, state-wide agency with such a wide range of responsibilities.*

- *Land development is a very broad field, [which] encompasses many disciplines when a significant project comes along. Small jobs do not require a great deal of environmental management as a rule.*

Other respondents provided a more detailed account of training provided inhouse by their organisation.

- *Recommendation of Local Environment Policy is that all staff undergo environmental induction training, making them aware of environmental responsibility personally and corporation's expectations and policy.*

- *Plant operators receive 'on-the-job' training to become aware of any EPA requirements which involve their particular tasks.*

- *The Safety, Health and Environment course is to provide the participants with a better understanding of the Company's SH&E policies and standards. Attention is focussed on the responsibility and role in ensuring safe and health working conditions and in protecting the environment.* (Paint manufacturer)

- *Most issues are addressed at a national level by BP (head office—Melbourne) and training as required.*

- *Reading all literature from Australian Environmental Pest Managers Association (AEDMA) and National Pest Control Association (NPCA-USA). Attending Association meetings in SA and as many AEDMA conferences as able to. All technicians are trained in conjunction with SA Health Dept. guidelines. We are a company with 9 staff who work together in all areas of caring for the environment. We believe our staff are sufficiently well trained in this area.* (Pest control)

- *All employees are trained and have passed AVCARE accreditation which I believe is going to be ongoing. Ongoing AVCARE training. Training available at present not regular.*

- *As a reprocessor we deal in waste plastic and all our employees are taught about contamination of waste, sorting of waste and proper disposal of various forms of waste. We help other companies achieve waste minimisation and practice it ourselves. Economics provide the incentive to minimise energy and water consumption and we only deal the certain plastics that do not generate harmful gases.*

- *Our staff are all made to be aware of our environment as one of the top priorities in learning the job as it is a very essential part of oyster farming. In oyster farming it is daily learning.* (Fisheries)

- *Through our safety committee, all roles are adequately covered on environmental issues within the company.* (Winemaking)

- *Apart from our botanical professionals (2) all of our staff have trained themselves or are trained inhouse.*

A number of respondents provided some negative feedback in relation to their experiences with education and training providers. Other respondents stated that they felt it best for the training to be conducted by the industry they are involved in or inhouse.

- *My only view is that employees in teaching and/or instructing positions [should] have field experience. The oyster industry is already one of few, financially supporting an environmental monitoring program.*

- *All the positions mentioned probably need information on environmental issues. Possibly ½ day would suit. TAFE—generally very poor instructional technique and poorly prepared presenters.*

- *As a one man operation currency is maintained via the industry. I believe that this training is best done within the individual companies involved.* (Agricultural aviation)

- *Due to changes in the industry (i.e. pressures by 'conservative groups') it became impossible for our small operation to survive hence the partnership was dissolved last year. As for TAFE, I found through my own experience that it may be right for recreational courses but the technical ones are a waste of tax payers money.*

- *Problem solving principally with various forms of waste disposal for example, air, water, solids, chemicals etc. Not happy for TAFE to do training—will become usual TAFE 'talk fest'.* (Abattoir)

- *Our company is a provider of services for aerial fire suppression operations and also firebombers. Provide a specialist role in aerial dispersant application operations for marine oil spill control strategies. Aerial application of dispersants requires a thorough knowledge of spraying technology to ensure a cost-effective operation to be mounted in the event of an oil spill. Close liaison with Government and the oil industry and ongoing research and development has enabled Australian Maritime Resources to be recognised as the leader in the marine oil spill control scenario. The individuals within the company structure (pilots, ground staff, managers) all require constant training and education on industry related upgrading, this must come from with industry research and development. The level and standard of training required is practical and based on operational experience and I do not think is in TAFE's 'area of influence'. Worldwide this is a very, very small industry and R&D is generally conducted by leading companies or government funded research.*

- *Most effective means of training seems to be on-job training or regional seminars conducted by professional instructors.*

- *I feel that there may be a need for environmental training. I studied a subject on energy management by distance education through an interstate university as a graduate diploma subject. I found the course too 'light' lacking in practical work costing too much. I gained little (not at all satisfied).*

- *Our pilot is to be part of a regional pilot for the Aboriginal Land Management Program. TAFE presently deliver basic courses but these are not always considered in the stringent delivery of mainstream programs.*

- *Our workers can access a TAFE centre, but we are not interested. Will use private source.*

Several respondents also felt that environmental management and/or the survey was not really applicable to them.

- *Not really applicable to owner/operative concerns!*

- *Not relevant—I don't employ anyone.*

- *No real education requirements—apart from a general policy within the office not to waste paper and putting it into recycling bin—nothing much else is done.*

- *All positions have a small degree of environmental training but this is not a high priority.*

- *No employees at present or likely to in future—not applicable.*

- *We are governed by the rules and regulations required on our waste licence and answer to the waste management board. Self employed—not applicable.*

- *Waste of time as I don't employ anyone.* (Farmer)

- *Training not required in the poultry farming industry.*

- *Many questions not relevant as we are a family partnership and have no employees. No chemicals etc. are used, we grow wheat in farmer's own soil.*

Respondents who are involved in the farming sector also had comments to make regarding training and environmental issues generally.

- *This survey is largely unrelated to self-employed farming operations, yet collectively farmers are responsible for a large percentage of the country, environment. Environmental issues are intrinsic in all decisions related to the business. However, current economic factors tend to override the well known long term benefits. The highest level of training possible would be attractive, but as no opportunities exists for farmers self-employed to attend then video/printed information would be most appropriate for us.*

- *Land owner—not applicable.*

- *Our two farms are managed by my wife, my son and myself. Environmental problems we are mainly concerned with are chemicals,*

soil erosion and soil salinisation. We obtain our information from the Soil Board, Ag Bureau, magazines, field days, product suppliers. We cannot afford to employ anybody.

The preceding comments principally relate to the self-employed people. Moreover, the latter seem to feel that training is something *for staff*, not recognising that they themselves may require training also. In many cases the training needs in this area have not yet been fully explored by the organisations involved.

- *Operatives and administrative groups are not well served at present, managers, technical supervisors have opportunities to acquire training. Currently a TAFE course is being conducted internally as an introduction to env/training.*

- *None of council staff have any training in environmental management and I am not conversant with what type of training would be required.*

- *All groups are not well served due to the amount of State legislation that is required to be administered.*

- *Managers and technical staff are not well served in terms of training, however it is also true that graduates in the marketplace seem to have little exposure to or experience with industrial contamination issues such as those likely to have an impact on manufacturers due to new legislation. We partner other organisations who have capabilities we do not currently possess and who see that we have capabilities they do not currently possess (e.g. management of projects, site rehabilitation).* (Occupational & Environmental Health Consultants)

- *All employees have not had training in environmental management.* (Local government)

- *The majority of employers in the SE of SA are in the 'small business' range. It is vital that managers of small businesses such as this are familiar with all aspects of environmental legislation and regulations, therefore, it is the manager of the small rural business who are not well served.*

- *No one else (apart from CEO) in this small organisation has a direct responsibility for environmental management.*

- *No training plan in place with respect to environmental management training needs.*

- *Unaware of any specific training needs in this area.*

- *Perhaps senior management require legislative updates.*

- *Training needs in this area are not fully explored. Possibly at technical and operative levels.* (Forestry)

A variety of other comments were made by respondents in relation to issues arising from the questionnaire. These included:

- *In my organisation, professional chemical or process engineers are trained by universities.*
- *We are very conscious of environmental issues and are aiming towards 'environmentally friendly' products overall. In some instances though this is not possible.*
- *While no specific training is required, we need to keep abreast of the changes.*
- *If we carry out any activity which in our opinion may damage the environment either directly or indirectly we (normally) contact the appropriate statutory authority and check.*
- *While there is no environmental manager, an environmental policy and committee exist.*
- *Probably will not be trained in TAFE but have units of environmental education incorporated into existing post-graduate courses in OH&S and occupational hygiene.* [Deakin Hygiene Course].
- *Managing director is fully qualified in all roles.* (Pest control)
- *One-off courses so that country people can come to the city.*
- *I feel the need for entomologists and plant pathologists would be more pressing.*
- *The Outback Areas Community Development Trust (OACDT) uses the Electricity Trust of South Australia as its technical advisers for the operation of OACDT power stations. Advice includes requirements associated with environmental legislation.*
- *Officers are currently undertaking various areas of training and must rationalise their workloads. Heavy reliance is placed upon expertise in government agencies.*
- *Urgent requirement for environmental management package. Land managers, solar technologies: Diploma, 3 yr, face-to-face, video, workshops, Certificates, 1 yr. Graduated courses required ranging from school leavers and progressing though full certificate and diploma course on all aspects of environmental management. No environmental management courses available except those delivered by this organisation to TAFE colleges and secondary schools, council management and to DENR personnel.*
- *3-5 days in one hit at the appropriate college.*
- *The training is available, it is getting the people to understand that they need to do it that is the problem.*

- *I am interested in beginning a course for trainee consultants, especially with reference to the sustainability and environmental areas.*

- *Training needs to be flexible, in movement into and out of any environmental training program. Shouldn't be a structured end time.*

Summary

To support the consultation process a survey was developed and dispatched to 1430 organisations representing a cross-section of South Australian industry and government, with a strong interest in the environment and/or organisations with a potential to affect it significantly.

Many of the organisations contacted may merely have been agencies of companies based elsewhere. These either did not respond, or indicated that either their environmental policy or their environmental impact was made elsewhere. Others surveyed do not see the need for training as they are owner-operators or family businesses who do not believe they need training.

In summary:

- the great majority of those responding to the survey considered that environmental management was a growing issue, or at least a component of many jobs;

- while about one third of respondents felt that political and social pressures brought about by environmental concerns were having a strong or extremely strong impact on their organisations, the remainder indicated only some slight or no impact;

- owner managers or CEOs were seen to carry the predominant responsibility for environmental matters. They therefore have training needs to ensure that adequate training and monitoring processes are in place so that their organisation can demonstrate due diligence;

- most were aware of the EP Act and the survey indicated that a plethora of acts have environmental components. Principal amongst these were the Waste Management Commission Act, Clean Air Act, Public and Environmental Health Act, Development act and the Water Resources Act. In all over 34 Acts were nominated. The relative importance may reflect the respondent group;

- most organisations do not employ an environmental manager. Those who did used them to meet their legislative and/or legal responsibilities and compliance. They were also used in the preparation, implementation and review of environmental policies, plans and assessments, and, to a lesser extent, to provide strategies, management and best practice advice in

relation to environmental matters. They also had a training and advocacy role;

- those organisations who do not employ an environmental manager, but who do have environmental responsibilities are overwhelmingly concerned with legislative and statutory compliance, legal requirements and meeting organisational standards and obligations in relation to the environment. Waste disposal, minimisation, monitoring and management is the next most common need, along with occupational health and public safety. A range of other tasks are outlined on pages 34 to 36;

- major needs are therefore in environmental awareness, law and act compliance and waste minimisation and management. In addition, a range of needs were identified for staff in management, professional, technical, administrative and operational occupations. These include waste and dangerous substance management, specific technical skills, staff management, problem-solving, chemical usage, report preparation, investigative methods and so on;

- overwhelmingly for all areas, the respondents appear to be looking for courses that are short (half to three to five days), delivered during the day and which may not necessarily lead to an award. This suggests that it is the information and skills which are desired, not *necessarily* formal awards and qualifications;

- TAFE has a strong presence as a potential training provider at all levels (management to operative), but is particularly strong in administrative and technical training. Inhouse provision of training is also seen as valuable and TAFE needs to explore opportunities in support of such provision;

- while there is satisfaction with TAFE as a provider, TAFE's satisfaction ratings are lower than for universities and private providers (in the area of 'environmental' training) (nevertheless there may be sampling issues acting on these data);

- access to TAFE is clearly adequate (with 83.3% indicating they could access TAFE), with those not having access needing to be supported by a variety of delivery approaches and options;

- because of the diversity of training needs both across the spectrum of the 'industry' and even within organisations, it is very hard to specify training needs and numbers with any precision;

- about one third of the organisations responding to the survey use outside consultants, principally in the area of environmental law and regulatory compliance, planning, site contamination, auditing and health;

- only 22% of those responding used volunteers; however most felt it was important they be trained in environmental matters. However, the majority of organisations responding would only support this training to a small extent or not at all;

- 61.8% of those responding rated environmental training in their top 10 priorities for training;

- the majority of organisations, however, provided no formal or inhouse training. Information on the environment was obtained through pamphlets, on the job or by word of mouth. Short courses, videos and formal awards were also used.

Chapter 5
Graduates' perspectives

Introduction

A questionnaire survey was sent to 37 graduates from the disciplines of land management (Torrens Valley Institute of TAFE) and environmental health (Regency Institute of TAFE). A mailing list was obtained from the relevant institutes. Completed questionnaires were received from 27 graduates. This represented a 73% return rate. These graduates are representatives of a very traditional TAFE market in that they are, for the most part, career builders—adult employees looking to develop their skills and enhance their career options.

Student background

Twenty of the 27 (74.1%) respondents graduated in 1993, four (14.8%) graduated in 1992, one (3.7%) in 1991 and two (7.4%) in 1990.

Twenty (74.1%) respondents graduated from the Certificate of Land Management, the other seven (25.9%) from the Associate Diploma in Environmental Health.

Subject areas related to major areas of study included:

- vegetation, water, land, habitat, salinity and waste management
- local government legislative requirements
- food technology, inspection
- ecology, rehabilitation, sustainable development
- communication
- conservation farming, rural property planning, sustainable agriculture, rural land management, forestry, effective rural groups
- soil, water and environmental conservation, water resources
- public land planning, land use systems, policies, economics
- vegetation identification, native vegetation
- environmental health, microbiology, biology
- pest and weed control.

Reasons which attracted the greatest response as to why students undertook their course of study were: to get a job (n=12), to get a better job or promotion (n=10), to try for a different career (n=10), and to get extra skills for present job (n=9). Other responses included:

- get into another course (n=6)
- requirement of my job (n=5)
- interest (n=2)
- qualification (n=2)

- update skills (n=2)
- information (n=1)
- concern (n=2)

Further study

Eighteen of the 27 respondents (66.7%) indicated that they wish to undertake further study, one was not sure and the remainder did not.

Of those who indicated that they intend to undertake further study, 10 or 55.6% intend to study at a university, four (22.2%) at TAFE and three (16.7%) were not sure. One respondent indicated that they are intending to undertake further study at Skillshare.

The respondent who was not sure whether they were going to undertake further study suggested that if they did they would study at TAFE.

When asked in what subject areas they intend to study (or what course they intend to undertake), five respondents named the Land Management Course at Orange Agricultural College, University of Sydney. Other courses listed by respondents included an Associate Diploma in Land Management (n=3), a computing course (n=2), Environmental Health Management (n=2), a Graduate Diploma in Management, Occupational Health and Safety, Parks and Conservation, an Associate Diploma in Agricultural Production, a Bachelor of Applied Science (Natural Resource Management) and environmental management or art/design.

Current employment status

Twenty two of the 27 respondents (81.5%) are in paid employment. Five are unemployed.

Just over half of the respondents (51.2%) are employed on a full-time basis (one respondent emphasising that a six month probation period applies), two (7.4%) are employed part-time, five (18.5%) are employed on a casual basis, one (3.7%) respondent is employed under a LEAP course and five (18.5%) of the respondents are unemployed.

When asked which occupational category best describes present job, responses were as follows:

Occupation	No.	Occupation	No.
Manager	2	Operative	6
Professional	5	Clerk	
Administrative	1	Salesperson	1
Technical	5	Paraprofessional	2

Positions held by respondents include:

- reservoir keeper
- technical officer
- environmental health officer (5)
- enrolled nurse
- assistant park ranger/ interpretive guide
- environmental researcher
- authorised officer (2) (animal & plant control)
- land management officer
- resource officer
- LEAP trainee
- plant operator/ park assistant
- district superintendent
- property planning coordinator
- laboratory technician
- horticultural advisor
- pumping superintendent
- contractor

Employers of survey respondents include:

- Engineering and Water Supply Department (4 respondents)
- The Adelaide City Council
- Elliston LeHunte Animal and Plant Control Board
- Animal and Plant Control Board
- State Flora (Department of Primary Industry)
- LEAP Freshstart Fleurieu
- Marble Range Soil Conservation Group, Friends of Coffin Bay Parks, Action Group for Protection of Coffin Bay Waterways
- Australian Trust for Conservation Volunteers
- District Council of Victor Harbour
- CSIRO
- MFP Australia
- Western Downs PMP Committee
- RAAF
- Dune research
- City of Hindmarsh/Woodville
- City of Port Lincoln
- Department of Environment and Natural Resources

Seven respondents (25.9%) have been in their positions for more than ten years, two (7.4%) have held the position for between three to five years, three (11.1%) for between 1-2 years, four (14.8%) have held the position for between 6-11 months and four (14.8%) have held the position for less than 6 months.

Twenty-one respondents (95.5%), who are employed, are employed in the public service, only one is employed in the private sector (*only recently been privatised*).

When asked in which industry respondents consider themselves to be employed, the breakdown of responses was as follows:

Industry	No.	%	Industry	No.	%
Agriculture	4	18.1	Transport & storage		
Mining			Communication/information technology		
Manufacturing	4	18.1	Finance, property & business services		
Electricity, gas & water			Public administration & defence	2	9.1
Construction			Community services/health	5	22.7
Wholesale, retail & trade	2	9.1	Recreation, personal & other	1	4.5
Environmental rehabilitation			Natural resource management	2	9.1

TAFE qualification

Of those employed, the majority (54.5%), felt that their latest TAFE qualification was extremely relevant to their present job, while 9.1% felt it was very relevant and 31.8% felt that their course was relevant. Only one respondent felt that their course was not relevant to their current line of work.

Ten of the twenty-two (45.5%) respondents, who are employed, stated that their latest TAFE course of study is valued by their employer. An equivalent 45.5% felt that their course was either extremely well regarded or very well regarded by their respective employers. Only two respondents or 9.1% felt that it was not very well regarded. No respondent felt that their course was not at all regarded.

Environmental management

The vast majority of respondents (72.8%) strongly agreed that environmental management is increasingly becoming an issue, or at least a component of their position. The remainder 27.2% agreed with the statement.

Interestingly, while the majority of respondents strongly agreed with the above statement, the majority 54.6% of respondents only agreed that environmental management is increasingly becoming an issue or at least a component of the position of others in their organisation. Only 31.8% strongly agreed that this was the case, while 9.1% disagreed with the statement. One respondent did not reply to the question.

The vast majority 90.9% (or 20/22) of respondents felt that their position requires them to have an understanding of environmental issues. Only two respondents did not feel that this was the case and one failed to comment.

When asked to highlight the main tasks of their position and/or any other environmental components of their position, respondents to the survey provided the following array of responses:

- *Plan and manage reservoir reserves of Mt. Bold and Hope Valley reservoir including all weed control, erosion and revegetation works to ensure water quality is maintained.*

- *Appointed under the Public Health Act to promote the proper standards of Public Environmental Health. This includes the protection of the environment and persons from risks associated with noise, air, soil, water pollution. Education and community awareness is fast becoming a priority in achieving protection of the environment.*

- *Work with legislation being the Public and Environmental Health Act, Food Act, Clean Air Act, Health Act, Dog Control Act and Local Government Act.*

- *Management of land that includes weed and vermin control, erosion control, bushfire prevention, vegetation maintenance and revegetation.*

- *Weed control, revegetation.*

- *Public health complaints, odour, contamination, illegal discharge. Food contamination—preventative controls, investigation follow-ups.*

- *Coast rehabilitation, biological survey (fauna/flora), wildlife management, planning, environmental plans (e.g. Heritage agreements).*

- *Pollution control—environmental impact of undertakings completed by the Department of Defence.*

- *Co-ordinate groups of farmers into property planning groups. Educate participants on basic soil science and conservation farming techniques.*

- *Interpret mangrove/samphire/coastal ecology (wildlife etc.), illustrate environmental impact on the St Kilda management (i.e. urban stormwater, industrial pollution, human altered nutrient, sedimentation rates/cycles, rising sea levels and greenhouse factors, MFP proposal, emphasise the ecological, environmental and economic value of mangroves and the importance of their conservation/protection.*

- *Monitoring research, liaising with other organisations (i.e. community), monitoring vegetation.*

- *Research at the CSIRO on soils, comparing different soils in different areas with differing uses and the production of various agricultural crops.*

- *All aspects of public and environmental health.*

- *Land degradation and rehabilitation investigation, potential contamination of water sources investigation, waste disposal investigations (re: licensing), landcare.*

- *The control of pest plants by mechanical (chainsaw, grubber and handpull) and chemical (spraying including spot spraying and boom spraying) means, the control of feral animals (by 1080 & fumigation) and the revegetation of roadsides, reserves and private property by direct seeding.*

- *Boardwalk construction (Hallett Cove Conservation Park), erosion prevention. Some extremely basic conservation concepts training (because most trainers are not interested in the environment), weed removal, chainsaws, machinery, first aid.*

- *Control or eradication of introduced species of plants and animals (e.g. rabbits, foxes, goats etc.) and a list of proclaimed (SA Govt.) plant species. Reducing the risk to damaging the environment and protecting the State's agriculture and agricultural products and/or markets.*

- *Helping farmers to sustain their farms. Property management planning, revegetation, crop monitoring, advice on erosion problems.*

- *Sustainable use of ground water. Maintain remnant vegetation balanced against asset maintenance.*

- *Advise on the revegetation of native plants (i.e. windbreaks, salinity control, woodlots, cut flowers, ornamental, habitat replacement), seed collection.*

- *Advise and enforce control of feral animals and proclaimed plants. Have sound knowledge of rural land management and restoration of native vegetation and protection.*

On-the-job environmental training

Well over half (63.6%) of the respondents who are employed stated that their employer does not provide any on-the-job training in the area of environmental management. Of the 36.4% who indicated that their employers do provide training in the area, the following details of that training were provided.

Area(s) training provided	Level(s) of staff trained	How training is provided
Water quality, water catchment	Operatives	1-3 day training sessions
Environmental management, technical issues	All staff of the environmental health unit	Several 1-2 day on-the-job training sessions. (seminars provided by Aust. Inst. of Env. Health)
Native vegetation and wildlife management	To the level of Sr. Field Officers	4 day/week, 6 months on-the-job in the field with experts
OH&S	Management	Various
Education/environmental interpretation skills/techniques, preparation of displays	Boardwalk maintenance staff, administration	On-going training
Group facilitation skills Group co-ordination skills New technology Current policy	Management Management Management Management	3 day workshops Visit other coordinators Attend conferences Attend conferences
Boardwalk construction, environmental awareness, machinery (e.g. chainsaws), first aid, weed removal		Full-time on-the-job basic training. Some basic TAFE training—horticulture
Environmental awareness	Management	Biennial state conferences

Environmental information

The two most popular methods by which information about environmental issues is received, as indicated by respondents, is:

- pamphlets (n=15)
- attending seminars and conferences (n=14)

Other frequently used ways of obtaining information is by:

- word of mouth (n=13)
- on the job training (n=12)

Other less frequently identified means included:

- formal award courses (n=5)
- short courses (n=5)
- video (n=4)
- journals and publications (n=2)
- field days (n=1)
- correspondence (n=1).

(Numbers total greater than 27 as respondents could tick as many methods as apply)

Training providers

When asked which training provider they believed to be the most appropriate to provide training in environmental management, survey participants indicated the following:

	Uni	TAFE	Private provider	Inhouse
Management	**14**	12	4	8
Professionals	**14**	**14**	5	5
Administrative	4	**16**	4	14
Technical	5	**17**	5	11
Operative	3	**15**	3	13

The above table shows the number of respondents, indicating which training provider they thought to be most appropriate for providing training to the employee groups listed.

Respondents felt that the most appropriate environmental training providers for people in management and professional positions are the universities (followed very closely by TAFE), whereas TAFE was seen as the most appropriate provider of training for technicians.

Inhouse training and TAFE were popular choices for staff in administrative, technical and operative positions. Generally, private providers are not seen as being terribly appropriate in the area of environmental management training by the graduates who responded to the survey.

Training needs

Survey participants were asked in what areas (if any), do they feel employees within their organisation require environmental management training. They were also asked to state which provider they felt would be the most appropriate to provide the training, the approximate length of the stated course and at what level the course should be provided.

The responses provided in the survey returns with respect to environmental management training needs were quite varied and broad.

The most frequently identified areas of need included:

- pest animals and plant management
- vegetation/revegetation management
- environmental awareness/up-to-date environmental information

A number of respondents indicated a need for environmental training in areas related specifically to their areas of employment:

- infield knowledge
- specialist topics

Other areas identified by graduates included:

- wildlife management
- coastal land management
- habitat management
- water systems management
- pollution control
- waste disposal
- erosion control

The majority of respondents selected TAFE as the most appropriate provider for environmental management training; this was followed by a TAFE/uni combination.

The appropriate length of the environmental management courses also varied considerably. Shorter courses, on the whole, seemed to be the preferred option, that is courses ranging from one day training to three weeks (for example, for waste disposal, environmental awareness, erosion control). Nevertheless a number of respondents also felt that courses of between four months and six months would be appropriate in some areas (for example wildlife management, specialist topics).

Longer courses, of two to three years in length were felt by certain graduates to be appropriate in areas such as coastal land management and habitat management.

In terms of when the training should be provided, the majority of respondents felt that day training was appropriate, whereas, in the case of professionals, evening training seems to be the preferred option.

The majority of survey responses suggested that the a certificate should be awarded on completion of training.

Employer support for training

Five or 22.7% of the respondents felt that their employer would support training in the area of environmental management to a great extent. The majority, 13 (59%), suggested that their employers would support it to some extent, while one indicated that their employer would not support it at all. Other responses included a don't know, a not applicable and one participant did not answer the question.

Volunteers

Seven of the twenty-seven survey respondents (25.9%) are involved in volunteer work.

Roles undertaken by volunteers and areas in which training are required are provided in the table below.

Volunteer's role	Training need
Community liaison, information research, community developer	Human resource management, broad but general range of environmental topics
Campaigning, lobbying, displays, fundraising, promotion, research, projects	General environmental issues, PR, communication skills
Revegetation	Environmental awareness
Revegetation	Land management
Secretary greening group	Plant propagation, tree suitability
Tree planting, removal of exotic weed etc., fencing, erosion control	Revegetation techniques and weed eradication techniques, native plant ID, vegetation & fauna survey techniques
Vegetation management	Principles in sustainable vegetation management

Comments and additional information

- *No employment has become available in relation to the course as of August 1994.*
- *Part of the process of developing a Public and Environmental Health Management Plan with the focus on strategic management and evaluation techniques and continuous improvement philosophies.*
- *Seen in good light by many (Ass. Dip. Environmental Health), except with new University degree, course has been forced to become obsolete. Also not recognised adequately by new course with status.*
- *I feel all levels of employment should be given some indication of the pressures faced by each group e.g. field staff need to understand the pressures of management and vice versa.*
- *The CES do not acknowledge land management as a valid vocation as they have no category for it, so they are not helpful in providing job guidance.*
- *When trying to achieve change for the better in your local environment it is imperative to be educated and up to date on environmental matters.*
- *Much of my voluntary work is spent on coastal management. I feel there is a need for a course in matters relating to coastal management*

(unfortunately this was not included in the land management course although many aspects of arid land management [included in the land management course] relate to coastal management. I have written to local council to suggest they send some of their personnel to the course but they don't appear interested.

- *Training through seminars provided by the Australian Institute of Environmental Health to all environmental health staff is part of the process of developing a public and environmental health management plan with the focus on strategic management and evaluation techniques and continuous improvement philosophies.*

Summary

In addition to the consultations with a range of interest groups (chapter 3), and the survey to 'industry' (chapter 4), 37 graduates of the land management and environmental health programs were surveyed. Responses were received from 73% of those surveyed.

In summary:

- most had graduated from the Certificate of Land Management;
- their major reason for taking the courses was to get a job, a better job, change careers or gain extra skills. In other cases it was used to get into another course or because the course was a requirement of their job;
- of those employed, almost all respondents believed their qualification was at least relevant to their work and 91% indicated they felt that their course was valued by their employer;
- most wished to undertake further study, mainly at university level;
- most were in paid employment, although some were on a part-time or casual basis. They worked overwhelmingly in government or local government;
- most saw environmental management becoming an increasing component of their job and almost all of those employed felt that their position required an understanding of environmental issues. They were less sure that this was so for others within their organisation;
- well over of half of those employed (63.6%) stated that their employer provided on-job training in environmental management;
- their sources of environmental information and choice of providers of training broadly reflected those of the survey;

- shorter courses (1 day to 3 weeks) run during the day were preferred, with employers generally seen as supportive of environmental training at least to some extent

- the most frequently identified areas of need included:

  - pest animals and plant management
  - vegetation/revegetation management
  - environmental awareness/up-to-date environmental information.

- A number of respondents indicated a need for environmental training in areas related specifically to their areas of employment:

  - infield knowledge
  - specialist topics.

Chapter 6
Other perspectives

Introduction

Throughout the duration of the project, material was collected by a number of ways. Material was gathered during consultations; reports and information were returned with completed survey. Other pertinent reports were bought to the attention of researchers during informal discussions and telephone conversations.

The following is an analysis and summary of the material gathered. The material enhances the findings of this report, raises additional issues and broadens the discussion.

Environmental management course—a preliminary proposal

A returned survey was received accompanied by a report entitled 'Preliminary proposal: Environmental management course for Goyder College of TAFE, Port Pirie'. Its author, JD Reilly, proposes an environmental management course which:

> *Focusses on the development of practical and analytical skills required by future managers of natural resources in the assessment, restoration and maintenance of natural and human resources common to marine and terrestrial ecosystems.*

The report states that the proposed environmental management course could be divided into four main units. These being:

1 Environmental Studies I
2 Environmental Studies II
3 Environmental Techniques and Applications
4 Environmental Reparation, Techniques and Applications for Control, Restoration and Rehabilitation

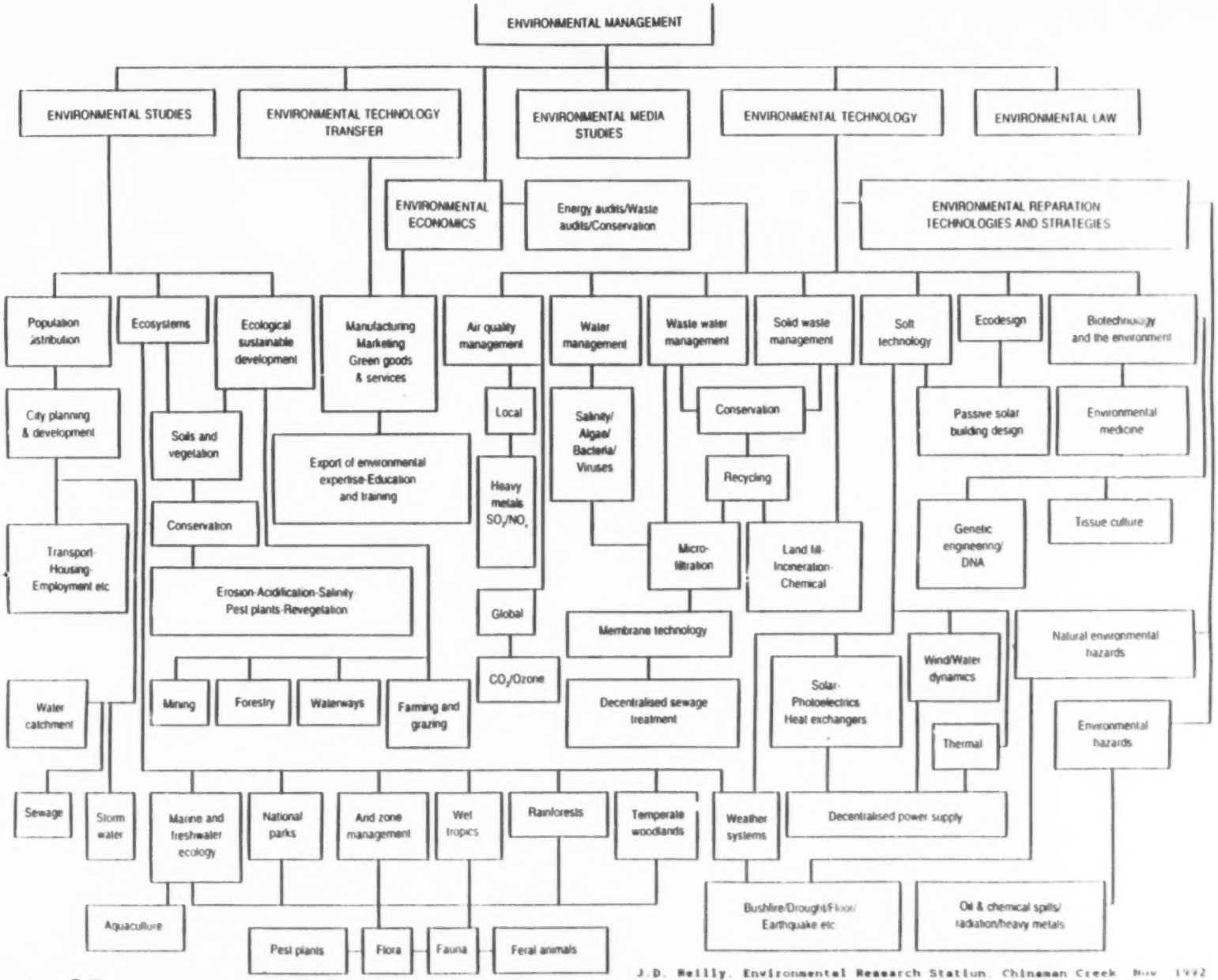
The range of subjects proposed by Reilly are broad and cover a variety of environmental issues. While the subjects proposed are too numerous to detail in this report, the following are those which have been proposed by Reilly and have also been raised as important by respondents in the training needs survey.

Environmental Studies I

- plant identification
- data collection, compilation, analysis
- field techniques

Environmental Studies II

- env'tal law/legislation
- Marine and freshwater ecology
- management plans



J.D. Reilly. Environmental Research Station. Chinaman Creek Nov 1992

92

93

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- conservation and recycling
- soils and revegetation
- environmental hazards
- environmental pollution

Environmental techniques and applications

- water and wastewater treatment
- air quality management
- solid waste management
- liquid waste management animals

- Environmental Impact Statements
- economics of pollution
- economics and mining

Environmental reparation techniques and applications

- environmental rehabilitation (soil erosion)
- coastal rehabilitation
- biological, biochemical control of pest plants and
- stormwater runoff and sewerage disposal

As part of the proposed course it is suggested that:

> *To undertake the course outlined, it will be necessary for students to have convenient access to representative illustrations of the environmental problems discussed.*

This is an important issue. Numerous respondents to the training needs survey forming part of this project emphasised the importance of on-the-job training or the incorporation of environmental training into field or real work experience. Suggestions such as these gives the impression that there is a desire amongst organisations for a more 'hands-on' and practical approach to training (as opposed to the traditional classroom teaching approach). This has important implications for course structures and delivery arrangements. It is suggested that:

- individual programs be as short as possible, but within a broader structural framework;
- they be practically oriented;
- they be delivered using a variety of approaches—including, for example, problem-based approaches, workshops, learning networks and contract learning

Reilly's proposal also lists a number of possible career opportunities for those who undertake the course. *Graduates in the course are likely to find positions in the following areas . . .*

- environmental managers, assistants and researchers to industry;
- town and city planners—research assistants and environmental advisers;
- plant and animal pest management—control officers—contracts and employment with local and state government;
- land resource management—Department of Environment, Land and Agriculture;
- environmental advisers and technical assistants to Federal and State emergency services;

- recreation and tourism management—assistants and advisers to private and Local Government parks and recreation facilities;
- plant ID, seed collection and propagation and amenity horticulture—private, local and state government nurseries.

There are a number of vital issues which must be kept in mind with respect to the employment opportunities raised above. These include:

- the downsizing of State Government departments (for example where the 'core' is being reduced and more use is being made of volunteers);
- the outsourcing of responsibilities to local government from the State government;
- the reskilling of existing employees, rather than hiring of new employees (particularly in local government);
- the balance of people with environmental skills in the workplace. While 32.8% of respondents to the training needs survey indicated that their organisation will need more people with environmental management skills, 53.3% indicated that there will be no change in the number of people with such skills in their organisation.
- the use of survey approaches to gather information on environmental training needs. For example no response was received from the nursery sector to the training needs survey, raising the question of how important they feel environmental management training is for their industry. Alternatively it could have been that the survey did not represent a good mechanism for gathering their opinions.

A point of issue which arises from this is whether the proposed environmental management course will be more relevant to those looking to get into the environmental management industry or whether it has more relevance to those who are already employed in this area and who want to 'rejig' their existing skills to deal with a new range of responsibilities and priorities.

The consultation process tends to support the latter. Therefore the structure, delivery and marketing of such a course will need to be extremely well focussed and carefully targetted.

Green jobs in industry

During the course of this project the ACF-ACTU released the *Green jobs in industry: Research report*, May 1994. The project set out to investigate the potential for 'green jobs' in the Australian economy. In doing so, the report has demonstrated very strong growth in jobs in environmental industries from 1988 to 1993, with employers expecting further strong growth through until 1995 at least.

The five industries targetted in the report were:

- waste management and clean production
- recycling
- energy efficiency and renewable energy
- water and waste water
- ecotourism

Waste management and clean production

In terms of waste management and clean production the report states:

> *Increased expense of waste disposal and stricter waste control laws have encouraged industry to look at new ways of reducing, revising or recycling waste.*

This point is also emphasised in our report. Stricter and more rigid laws will force companies to change their current patterns of behaviour.

Unfortunately response to the training needs survey from those involved in the waste management sector was very poor indeed; however, a slightly better response was received by those who described their main activity as recycling. Once again this raises the question of the importance of environmental training in such organisations or, again, was a survey not an appropriate means of collecting information from this industry?

An article in *The Advertiser* (1 Oct, 1994) entitled 'Coming clean on a problem of waste' highlights the following issue:

> *Adelaide is littered with good dumping land but needs waste companies to clean-up their acts and become better neighbours the EPA believes.*

The objectives of the Environmental Protection Authority (EPA) in relation to waste is that they ensure that waste companies move 'as rapidly as possible to the best practice standards'. The highest priority is to ensure the development and management of standards. As stated in the article 'certainly people have seen probably very low standard operators in the past'.

If current legislation is made stricter and the EPA is successful in encouraging waste companies to adopt best practice standards, then it may follow that waste companies seek the appropriate environmental management training for their employees. The companies using their services may also demand this training to meet their due diligence requirements and achieve their own environmental performance standards.

The Green jobs report also focussed its attention on small- to medium-sized industries. The report states:

> *While large companies have made some shifts, little attention has been focussed on small to medium sized enterprises which make up 96% of all private sector firms.*

Referring to the waste management industry, the report states that there are hundreds of one to two person contractor businesses who collect and cart waste to the local tip.

As stated previously in this report, it is these one to two person operators who do not feel that 'environmental' training is relevant to them. They see such training as being relevant for others. That is, those they employ, not for themselves. (This is also true of other sectors of the broader environmental industry).

While these one to two person 'contractor businesses' may not, as yet, be aware of their environmental obligations and responsibilities, trends indicate that they will, increasingly, need to show that they are adequately trained and that they do operate in an environmentally responsible manner.

In addition to the lack of environmental awareness of most small business operators, the Green jobs report also highlights a number of other barriers to growth and change in the environmental area. These include the reluctance:

- of the broader business community to embrace best practice environmental management;
- to undertake spending on environmental matters unless absolutely necessary.

These barriers may however be diminished with the second round of the South Australian Government's Cleaner Industries Demonstration Scheme. The scheme offers financial assistance to environmentally progressive industries (interest free loans of up to $100 000 or grants of up to $15 000) and is aimed at:

- assisting South Australian industries to implement low waste or no-waste technologies;
- demonstrating to companies the significant financial and environmental benefits of adopting cleaner production.

The scheme gives preference to small- and medium-sized industries.

The Green jobs report also examined employment growth in the ecotourism industry. Our survey also included a sample of 'ecotourist' operators. However as stated in the Green jobs report:

> *It wasn't possible to determine who could be in the broadest sense regarded as authentic ecotourism operators.*

Despite this problem, fifteen travel operators, who we believed were involved in 'ecotourism', were sent a training needs survey. Unfortunately, only one survey was returned and that was from a State government department operating in the tourism area.

Our extremely low response rate is not surprising in the light of the green jobs unit nationwide survey of 440 ecotourist operators which only resulted in a 16% response rate.

Notwithstanding the low response rate, respondents to the Green Unit's survey indicated that:

> *Cost, time, lack of suitable courses and distance barriers were significant constraints to staff training.*

A perceived oversupply in the market was another issue raised by the Green Unit survey.

> *At the moment there are more people providing ecotourist opportunities than there are ecotourists.*

Furthermore, employment growth in the area is challenged by the fact that:

> *.....small operators are mostly marginal, in it for the lifestyle, and don't wish (or can't afford) to employ others. All this means few jobs. If you want a job in this industry best to make your own.*

This probably explains the nil response received from ecotourist operators surveyed as part of our project. That is, one to two person operators not seeing the survey as relevant to them. Other issues raised by the Green Unit's survey which may explain our poor response include:

> *Many ecotourism operators are small companies who do not have the means to undertake involved and expensive training.*

> *I am very cynical of filling in forms that have motives of justifying 'training'—those of us at the coal face want better trained staff but the complex issue of successful business, wages, training is the control of academics and well paid experts usually influenced by larger operators controlling scam businesses—the real tourist/ecotourist industry is a small business exercise controlled by successful survivors.*

There has, however, been a move by the South Australian Government to promote ecotourism in the State. The government has recently released 'Ecotourism: A natural strategy for South Australia', stating that 'South Australia is well placed to take advantage of the rapidly increasing international growth in ecotourism'. This, in turn, could have significant training implications.

Employment initiatives

Current initiatives to encourage employment in the environmental area include the Regional Environmental Employment Program (REEP), which is one of the new work opportunities announced in the Commonwealth Government's White Paper on restoring full employment.

The scheme is designed to 'create regional employment opportunities using existing labour market programs, LEAP and Jobskills to tackle regional environmental problems in a strategic way'. (*Envirofiles*, No. 4, Aug. 1994) The scheme will:

- provide up to 5000 jobs (nationwide) in 1994-95 and 10 000 in each of the following three years;
- provide future job opportunities in the environmental repair industry, green products industries and ecotourism.

Knowledge, skills and attitudes

While the Green jobs report concentrated on business attitudes to the environment, a recent study conducted by the NSW EPA entitled 'Who cares about the environment' looked at knowledge, skills, attitudes and behaviour of people with respect to the environment in NSW.

The survey found that the most important environmental issues in NSW are water quality, air quality and waste management and disposal. In this survey ocean and beach pollution, fresh water pollution, air pollution and industrial emissions/waste were all cited as significant issues.

These findings correlate closely to our study which shows that the current strong environmental issues in South Australia are:

- water management
- pollution control
- waste management and minimisation
- greening

The NSW EPA survey also found that:

- most respondents thought that environmental regulations of industry need to be stepped up;
- respondents nominated waste and lack of education as the two major causes of environmental problems in NSW;
- respondents often justified their own environmentally damaging behaviour as due to 'necessity' or there being 'no practical alternative'.

Environmental management training

Throughout the course of the project it became clear that a number of organisations provide their own members and/or staff with environmental training while a number provide courses to the public.

Apart from the more obvious providers and courses (for example University of South Australia, Flinders University, University of Adelaide as well as TAFE institutes and universities interstate), there are also a number of less obvious providers of environmental training.

The following are examples of the type of training made available to staff, association members and the public by a variety of different organisations.

The South Australian Environment Protection Authority

The South Australian Office of the Environment Protection Authority has been operating for a significantly shorter period than its New South Wales counterpart and with a significantly lower number of staff, hence, it is currently in the process of conducting a training needs survey to *determine the training and development needs of staff.*

As part of the training and development drive, the EPA has identified a number of key areas upon which it will focus. This focus will include training seminars on the EP Act (to dominate the schedule during November), the implementation of OH&S training (to be implemented as soon as possible), the development of an induction program and handbook for new staff, the development of a staff training and development program and a core discipline introductory training program.

Future training courses provided by the EPA to their staff will include:

- noise assessment/control 2 hrs
- development application information systems 2½ hrs
- protection of water environment 2 hrs

• marine protection	2½ hrs
• recycling and waste	2½ hrs
• effective meetings	2 hrs
• health and safety (EPA executives)	8 hrs
• energy management	2 hrs
• understanding the EP Act (nominated staff)	2 hrs
• contaminated sites	2 hrs

Volunteer training courses

The Australian Trust for Conservation Volunteers also provides numerous training programs for volunteers. Training is provided on weekends (Saturdays and Sundays), or during the week (Mondays to Fridays). The following are examples of the type of training made available by the Trust:

- tree planting for Trees for Life
- use of direct seeding techniques
- community tree planting
- identification of native trees and shrubs
- Bradley method weed control for private landholders
- information and site visit on the wetlands
- water quality testing
- methods of native seed collecting
- tree planting for roadside revegetation project
- revegetation—Agro Forestry Program
- hand direct seeding and fauna survey
- mine site restoration

Permaculture

Accompanying one of the returned training needs survey questionnaires was a letter from the Permaculture Network of South Australia. In both the survey and accompanying letter it was stressed that *'permaculture is about environmental management'*; that is:

> *The permaculture design system has an ethical basis, requiring those practising it to care for the earth, to care for people, to reduce population and consumption and to return all surplus to the system.*

Against this background it was stated that:

> *There is no reason why the Permaculture Design certificate should not be included in TAFE courses, also as an elective in other secondary and tertiary courses, provided that it is taught by graduates of the Permaculture Institute, and the full curriculum set down by that Institute is covered. However, since the essentials of Permaculture can only be grasped by putting the principles into action and living the ethics to the best of one's ability, qualifications beyond certificate level are based, not on a set curriculum, but on work actually carried out, and subject to ongoing peer review. Such a format constitutes*

Competency Based Vocational Training at its most effective and is not readily achievable within the academic context.

Accreditation in Permaculture at any level can be obtained only through the Permaculture Institute and it is unlikely that the Institute will relinquish its right to issue such accreditation, or to determine the curriculum for the basic Permaculture Design Certificate.

Current procedure, where permaculture is taught at certificate level as an accredited course through a government institution, is that students apply directly to the Permaculture Institute for a Design Certificate, with evidence that they have completed the required curriculum.

Other environmental training initiatives

A letter was received from the Institute of Brewing. The letter stated the following:

Most major brewing and malting companies in Australia are undertaking or planning training relevant to your enquiry. The companies concerned in SA include:

- *Adelaide Malting Company Pty Ltd*
- *Coopers Brewery Ltd*
- *Joe White Maltings Ltd*
- *SA Brewing Company Ltd*
- *SA Malting Company Pty Ltd*

The University of Ballarat, with which institution the malting and brewing industry maintains close contact, covers environmental aspects in its Graduate Diploma in Malting and Brewing Course and in the Introduction to Malting and Brewing Short Course.

As a section we maintain close contact with various state FITC's and other bodies, in particular with regard to the interfacing accreditation training with tertiary and sub-tertiary courses relevant to our industry. . . .

A letter from a leading South Australian winery stated:

Tertiary qualifications necessary to effectively manage a winery and vineyard should and usually do include a lot of environmental training education. I believe that it is senior management's responsibility to have environmental training rather than at the workers' level, because the workers are only acting under instruction from senior management. Vignerons and winemakers are generally very aware of environmental issues as vineyards are long-term projects that need to be sustained.

I therefore believe that any environmental management training for viticulture and the wine industry should be aimed at senior management in tertiary education.

A module in the operators training program in the pharmaceutical industry developed by ACTRAC addresses the environmental issues. ACTRAC projects in waste management and the Scitech project are also of considerable relevance to this present work.

Competency standards

Correspondence received from the National Training Board provides information regarding how the Board is dealing with environmental issues in standards development and endorsement.

1 The Board does not have a standards body that looks specifically at environmental related competencies as these are expected to occur within relevant industry areas.

2 In terms of CSBs covering, or intending to cover environmental management issues in their standards, in recognised CSBs the areas identified are:

- Production Horticulture, Irrigation and Grain in the Rural CSB (asked them to consider a wider impact than this)
- Water CSB (fairly new and still sorting out their development framework)
- Management standards in Local Government
- Pest Control services which comes under the Property CSB
- Mining CSB, especially open-cut
- Fishing CSB in their future work
- Meat CSB—again fairly new.

There are also sectors such as Parks and Wildlife who would have an interest but who do not currently have any status with the Board or are an ITAB.

The correspondence also stated the following important point:

> *We should bear in mind that most standards brought forward to the Board to date are for operatives and some supervisory level positions. Perhaps the feeling is that management takes responsibility for the area concerned and we have yet to see many examples of management competency standards. Either way I can assure you of the Board's keen interest in addressing environment related training through standards if indicated.*

Other correspondence from the Board was related to competency standards likely to include aspects of environmental management.

> *'The Local Government CSB intends to forward their completed standards to us within six months but at this stage have identified and prepared in draft form the following sectors . . .*
>
> - *Environmental development*
> - *Parts of the Capital Cities project*

- *Waste management and recycling*
- *Water and waste water*

University of South Australia

During the consultation process it was drawn to the researchers' attention that the University of South Australia offers a number of courses in water and wastewater management. These are:

- Joint Universities Master's Program in Hydrology and Water Resources
- Graduate Diploma in Hydrology and Water Resources
- Graduate Diploma in Municipal Engineering
- Graduate Certificate in Water Engineering

The Masters course is of one year's duration whereas the Graduate Diploma and Certificate are of 9 months and 4 months duration respectively.

In addition to the above, the Faculty of Engineering has also developed the following specialised intensive courses:

- Operation and Maintenance of Treatment Plants (24 weeks)
- Planning and Design of Treatment Plants (24 weeks)
- Treatment Plant Operator Training (8 weeks)
- Treatment Plant Laboratory Officer Training (8 weeks)

The University is also a partner of the Australian Centre for Water Quality Research (a water industry-based research centre).

Project managers

A range of program management groups were contacted regarding the extent to which curricula and training programs in their area dealt with environmental issues. To a large extent, relatively little attention was paid to environmental matters in current program offerings. There was felt to be some potential to develop modules in a range of areas.

This again raises the issue of the approach taken to environmental issues in TAFE offerings. They need to be developed at an appropriate level and related to the potential for environmental impact by those individuals receiving training. Such training may be dealt with by:

- specialised modules
- revising or re-emphasising the content of some programs, even perhaps only in minor ways
- appropriate changes in teaching philosophy and approach.

It is suggested that:

- program managers meet as a group and with staff in their program areas to consider the issue; and
- if appropriate, programs be revised and complimented with any attendant staff development issues being addressed.

Summary and conclusions

A range of other perceptions was gathered in the course of the project. These included:

- the insights provided by a preliminary proposal for an environmental management course prepared for Goyder College at Pt Pirie
- the *Green jobs in industry* report
- a letter from the National Training Board regarding relevant competency standards
- relevant university courses—principally ones in water and wastewater management (although a range of other programs both in South Australia and interstate would be relevant)
- telephone interviews with the co-ordinators of a number of program management groups.

In summary:

- Reilly's report provides a useful framework and a potential structure for a program development. Nevertheless, in light of the expressed needs of clients reported here, it is likely that the suggested topic areas need to be packaged differently and in smaller, more specific modules or topics;
- practical and hands-on approaches are called for, reinforcing the role of problem-based approaches, workshops, training networks or contract training as suitable means of packaging program offerings;
- small- to medium-sized companies make up the bulk of industry and introducing any formal training at all, let alone environmental training, may be challenging;
- a range of other bodies is involved in the provision of environmental training. TAFE training should complement and recognise this training appropriately in its training. It should look at developing appropriate credit transfer, articulation and other recognition arrangements with a range of suitable providers and industry associations;

- a number of competency standards bodies has addressed environmental issues. These should be examined in relation to any program development or redevelopment. This should apply to both short courses and mainstream programs;

- curricula in a range of program areas at present have relatively little environmental material incorporated (apart from a range of obvious programs in rural, horticultural and scientific areas). The matter needs to be considered by the program management groups jointly and individually to determine what response, if any, is needed.

Chapter 7
Conclusions—where to from here?

Introduction

This project was commissioned by the Government of South Australia, through DETAFE, to examine issues related to training needs in the environmental area. It has built upon earlier work conducted by Chris Hogan (Hogan 1993). The present project has involved a survey and extensive consultation with a wide range of groups with interests in the environment. Our report has attempted to establish:

- what environment management is;
- who is involved;
- an occupational framework for the area;
- the training needs of occupational groups;
- numbers requiring training.

The specific questions raised above are addressed throughout the report and in the executive summary for the project.

This chapter will summarise and draw conclusions based on the information gathered during the project. In addition, a range of suggestions has been made which may be considered by appropriate individuals and groups within DETAFE and which could be used as the basis for further action.

Environmental management—the background

Australia has international obligations which require, ultimately, that training in environmental issues be addressed. In addition, there are community, political, media and, increasingly, economic and legislative pressures to improve environmental practices.

As such environmental issues potentially touch a wide range of TAFE's offerings in South Australia and affect them to a greater or lesser extent. It is clear that:

- the great majority of those responding to the survey conducted as part of the project considered that environmental management was a growing area of concern and made up a component of many jobs. The nature of the component is dependent, in part, upon the individual's responsibilities within organisation and the environmental sensitivity both of what they and their company do. It is also dependent on whether this environmental aspect is recognised by individuals, their employers and within their industry or industry sector more generally;

- most, however, indicated that political and social pressures related to environmental issues were, at present, only having a relatively minor impact on their organisation;
- 61.8% of those responding to the survey rated environmental training in their top 10 priorities for training;
- owner managers or CEOs were seen to carry the predominant responsibility for environmental matters;
- most organisations do not employ environmental managers. Those who did, used them to meet their legislative and/or legal responsibilities and compliance. They were also used in the preparation, implementation and review of environmental policies, plans and assessments, and, to a lesser extent, to provide strategies, management and best practice advice in relation to environmental matters. They also had a training and advocacy role;
- those organisations who do not employ an environmental manager, but have environmental responsibilities are overwhelmingly concerned with legislative and statutory compliance, legal requirements and meeting organisational standards and obligations in relation to the environment. Waste disposal, minimisation, monitoring and management is the next most common need, along with occupational health and public safety;

- small- to medium-sized organisations make up the bulk of South Australia's various industry sectors, and introducing any formal training at all, let alone environmental training, can be challenging. Often these organisations are owner operators and see training as something *others* need.

Environmental management and training approaches

Environmental issues gave rise to a wide range of training and retraining needs. A number of competency standards bodies and a range of national and State/Territory initiatives are targetted at environmental concerns. It is clear that:

- a number of competency standards bodies has addressed environmental issues. These should be examined in relation to any program development or redevelopment. This should apply to both short courses and mainstream programs;
- the environmental training market is a broad and a heavily segmented one. It is concerned with conservation at one end of the spectrum and managing and minimising the detrimental impact of the built environment and man on the biosphere at the other end;
- the practical implications in responding to the findings of this project involve the use or adaptation of existing curricula and training programs to make them appropriately environmentally focussed. Alternatively, curricula in their current form could be taught within a different philosophical framework (that is, one which is more environmentally conscious). Other programs,

however, may need to be developed which are specifically environmentally focussed and structured to meet both initial training needs and, more importantly, the needs of those undertaking retraining or ongoing training.

A focus on environmental issues in both specifically designed programs and those which are components of other mainstream vocational programs may require that training needs in specific vocational areas be examined and that appropriate staff development programs for lecturers in environmental issues may need to be progressively developed and implemented.

The introduction of the South Australian environment protection legislation presents TAFE an opportunity to develop a range of programs which can be delivered in a variety of ways and customised to suit the needs of particular end users.

A survey conducted overseas in the early 1980s indicated that, for those purchasing training goods and services from bodies such as TAFE the key criteria for buying outside rather than undertaking internal development were:

- the range of resources available
- the quality of the end product

Key criteria for deciding between alternative suppliers were (in order of importance):

- ability to customise programs
- cost
- favourable experience with the supplier
- reputation
- references/recommendations
- capability of the instructor (Phillips 1990, pp. 217–219).

These findings seem to relate closely to the 'messages' of our consultation process. They also concur with views expressed at a recent TAFE marketing forum held in Adelaide.

DETAFE and relevant institutes of TAFE throughout the State could therefore consider:

- gathering appropriate curricula and developing networks of staff and institutes engaged in similar training interstate and, possibly, overseas—for example New Zealand;
- developing and validating a suitable curriculum for the area where necessary. This process should involve the use of flexible and wide-ranging consultative processes. Due to the segmentation in this market, it is necessary to focus on particular areas of need, or particular potential client groups. As a result of these consultative arrangements, curricula should be capable of being customised;

- allocating the development of specific aspects of the framework to particular institutes based upon their specific expertise. DETAFE and its component institutions should also work coherently to develop relationships with the government departments and local government agencies to explore ways in which their organisational training needs could be met. Nominated institutes of TAFE may examine ways of working to develop closer relationships with relevant government departments and local government agencies to:
  - address their inhouse training needs;
  - examine ways in which they can supply needed training to those volunteers or contractors requiring relevant environmental training for tendering and to meet due diligence requirements;
- adopting a network approach to the *delivery* of environmental training by DETAFE;
- establishing a forum to investigate the lessons learned from developing, implementing and training in occupational health, safety and welfare and that these lessons be applied to DETAFE's strategies in addressing environmental training needs;
- actively co-operating with a range of government departments and local government authorities to address the training needs and priorities;
- developing strategic alliances with a range of other providers and pertinent groups with interests in environmental training; for example universities, private providers, professional associations and TAFE institutions interstate. Relevant institutes of TAFE may also need to co-operate in the development of a marketing approach to environmental training and may use such activities as a basis for developing a series of marketing plans to address specific and identified training needs in the broader training market. These plans should be based on identified priorities and training demands;
- making appropriate changes to mainstream vocational programs which are not predominantly environment-focussed to reflect appropriately growing community and industry concern with the impact of inappropriate work practices on the environment. Program management groups may therefore need to consider any required changes to their offerings to incorporate an appropriate level of environmental awareness and other training. This, in turn may give rise to a range of staff development needs which will need to be addressed within TAFE.

Areas of specific training need

On the whole, the surveys conducted during the project suggested:

- most of those surveyed were aware of the EP Act and the survey indicated that a plethora of acts have environmental components. Principal amongst these were the Waste Management Commission Act, Clean Air Act, Public and

Environmental Health Act, Development Act and the Water Resources Act. In all over 34 acts were nominated. The relative importance may reflect the respondent group;

- major needs are therefore in environmental awareness, law and act compliance and waste minimisation and management. In addition, a range of needs was identified for staff in management, professional, technical, administrative and operational occupations. These included waste and dangerous substance management, specific technical skills, staff management, problem solving, chemical usage, report preparation, investigative methods and so on.

More specific needs included:

- environmental awareness programs targetted at a variety of levels and occupational areas;
- environmental legislation and statutory compliance (a universally high priority);
- environmental planning and monitoring;
- technical skills in such areas as instrument operations, sampling processes, data recording and processing;
- waste minimisation and management (which, again, may have to be focussed on specific industries and industry sectors);
- water and storm water management;
- pest control;
- hazardous chemicals—handling and disposal;
- site rehabilitation etc.

Some of these programs may need to be developed from scratch. Others can be developed through the use, redevelopment or repackaging of existing programs guided by the findings of this project and further market research.

It has been particularly difficult to estimate the demand for these programs. (Appendix 7 contains some information.) Nevertheless it is clear that the major training need is in retraining or the provision of on-going training which provides those undertaking it with new or broader skills to meet the demands of changing jobs, roles and foci.

Curriculum framework and delivery arrangements

Reilly's report cited in chapter 6 provides a useful framework and a potential structure for program development. Nevertheless, in light of the expressed needs of clients reported here, it is likely that the suggested content areas need to be packaged differently and in smaller, more specific modules or topics.

Flexibility and simple training structures are particularly important in the area of environmental management training, simply because of the great variety of needs that exist in the area, ranging from the

needs of management and supervisory staff to those of operational staff.

Providing a flexible training structure is also essential for meeting different regional needs (for example, different council regions have different ways of dealing with waste management and have different problems and priorities). This, in turn, has implications for program content and the delivery approaches used. Moreover delivery approaches need to be flexible. TAFE could consider the use of action or problem-based approaches to training which are focussed as much as possible on meeting the immediate needs of program participants (problem- or project-based approaches, experiential learning etc.). In addition TAFE may be able to develop and support a range of learning networks through which both formal and informal training could take place.

Overwhelmingly for all areas, the respondents to the survey and those consulted appear to be looking for courses that are short (half to three to five days), delivered during the day and which may not necessarily lead to an award. This suggests that it is the information and skills which are desired, not *necessarily* formal awards and qualifications. Nevertheless the programs need to be structured in ways which maximise the potential for credit transfer, articulation and the recognition of prior learning.

Our project findings also suggest that there are differences in the perceptions of who should provide the training. TAFE is a preferred provider in technical and administrative training. While not the preferred provider in all areas, TAFE is also seen as having a strong role to play in professional, management and operative training. However TAFE programs need to be seen as *credible* and *fit for purpose*. The teaching staff used also should have credibility with their client groups.

Some of those responding to the survey clearly have found TAFE in the past less than a good and flexible provider.

In conclusion

Environmental training is clearly necessary at a variety of levels. It needs to be incorporated appropriately within a range of existing TAFE programs. It also has considerable potential as a program area in its own right. However, TAFE will need to examine ways in which such training can be provided in customer-focussed ways. The needs are diverse; so are the potential client groups. TAFE therefore has to develop its response within a strategic framework, by mechanisms which will meet the requirements of major groups in areas where there is the most consistent need.

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114

Appendix 1

Initial project brief

FILE DETAFE S 245-92

FOR INQUIRIES REFER

Ms Virginia Battye

Phone: 282 0704

OUTLINE FOR RESEARCH BRIEF IN ENVIRONMENTAL MANAGEMENT AND ECOLOGICALLY SUSTAINABLE DEVELOPMENT TO BE UNDERTAKEN BY THE NCVER FOR SA DETAFE

Purpose

To identify the scope of and opportunities for vocational education programs in environmental management and ecologically sustainable development in the SA Vocational Education Training sector by:

1. identifying and obtaining information on international approaches to vocational education in the area

2. conducting an occupational analysis to determine employment opportunities in the area for which vocational education programs could be developed.

Context for Research

There is increasing public awareness of the importance of environmental management and ESD.

At the international level, Australia is a signatory to the UNCED "Agenda 21" Agreement. Legislative provisions in South Australia and the establishment of the Environmental Protection Authority are likely to lead to a demand for training.

There is increasing awareness within industry of the need for and benefits of ecologically sustainable development, and environmental management, which is often linked to occupational health and safety issues.

The Multi Function Polis has environmental management and educational services as key priorities. This adds to the pressure for TAFE courses in environmental management in South Australia.

Current Provision of Programs in Environmental Management

ACTRAC is currently conducting a project on environmental management with emphasis on waste management. There is an attempt in this project to define the industry segment of environmental management. The outcomes of this project are not yet available.

At present the Certificate in Land Management is the only TAFE course specifically dedicated to environmental management offered in SA DETAFE. Other courses have modules relevant to the area.

The Port Adelaide campus of Regency Institute has a particular focus on environmental management with a Principal Lecturer, Dr Barbara Radcliffe, appointed to that program.

Summary

With the development of the Multi Function Polis and increased pressure from government and industry for ecologically sustainable development and environmental management the lack of training programs within the vocational education training sector, in particular within South Australia is a major concern.

The scope of environmental management and the employment opportunities and outcomes connected to it are not clear. Research in these two aspects is therefore required.

For further information on the research brief, contact:

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  Phone: 226 3390
- *Dr Barbara Radcliffe, Principal Lecturer, Environmental Management, Port Adelaide campus, Regency Institute*
  Phone: 47 8466

27 July 1993

Appendix 2

NCVER's response to the initial project brief

Defining the environment management industry and its training needs

A South Australian initiative for DETAFE conducted by the National Centre for Vocational Education Research

Bozena Vicary
Hugh Guthrie

119

Each year the National Centre for Vocational Education Research Ltd. is required to conduct a project for the South Australian Government in lieu of interest on a loan to purchase its present accommodation.

This year the project will focus on environmental management: What it is and TAFE's role in providing appropriate training in the field to address the needs of a wide range of interest groups and individuals. Programs or program components may also be developed to promote the concept and make individuals aware of their responsibility for environmental management, particularly in a vocational context.

Environmental management is the process of managing the component parts of our biosphere whilst promoting ecologically sustainable and economically feasible industrial and other activities which are internationally competitive. This may include all human activity which impacts upon the physical environment. Environmental management is therefore about rehabilitating and maintaining the existing ecosystem as well as controlling (if not decreasing) harmful environmental emissions and/or minimising excessive and wasteful use of non-replenishable resources.

Environmental management has increasingly become a focal interest, or at least a component of many jobs. There will be individuals whose primary responsibility is environmental management - it will be a major responsibility of their job. In addition there will be others at a variety of levels within organisations both in the public and private sectors, in cities, towns and rural areas, whose jobs affect the environment to a greater or lesser extent. Therefore TAFE must respond to this by:

- defining the term environmental management;
- identifying potential client groups;
- developing appropriate policy;
- undertaking consultations with a variety of interested groups and individuals;
- mapping the field in order to develop an occupational framework. This stage may also examine existing projects in relation to the identified person roles and project needs;
- developing a program framework (possibly helping to identify priorities for program development);
- beginning the implementation process (both by adapting existing programs and progressively developing new ones).

The project will continue work began by Chris Hogan's report (Environmental management: some future directions for DETAFE). It will complement work being conducted by ACTRAC at a national level and by a group of DETAFE staff with an interest in promoting an appropriate response by the SA TAFE system to existing and emerging demands.

Why is environmental management an important area of concern to TAFE?

The knowledge we have accumulated thus far stresses that environmental problems are increasing in number; they are becoming more critical and their effects are geographically widespread. Now is the time to address the impact that social systems are having upon out natural systems if we are to continue our economic growth. Governments in particular have a central responsibility in ensuring that ecologically sustainable measures are identified, legislated for, implemented and monitored for their inclusion in Australia's expanding and increasingly more competitive economic activities. A multi-dimensional approach encompassing legislative reform, general public education as well as the provision of appropriate training which is backed by adequate funding.

Socially, politically , economically and globally, the issue of environmental management for sustainable development has generated concern, commitment and a need for action. The public has been aware for some time now, that pollution of, and damage to, our ecosystem has reached alarming dimensions. This is evident in the growing public support for policies and

action in environmental protection and management. Indeed, South Australia is introducing new environmental legislation and establishing an Environmental Protection Agency (EPA). Politicians and the media have responded to public pressure and articulated their concern about our urban, rural, industrial and natural environments. Political parties at the state and federal levels are developing policies and advisory bodies in this area. Business organisations are becoming more aware of environmental issues and the promotion of 'environmentally-friendly' products and practices. On the global dimension, the United Nations Organisation has formulated a program of action in the form of *Agenda 21 Agreement* which sets out an international agreement on a range of environmental matters and issues of development. Australia is a signatory to this agreement.

C K Basu, the director of the Columbo Plan Staff College for Technician Education in Manila, emphasised the importance of environmental education as a strong focus for vocational education in a recent article in *The Australian Training Review* (June 1993, pp 5&6). Regional initiatives are being co-ordinated through the College, and Australia is participating in the process. A survey of Columbo Plan member countries found that "teachers in vocational education institutions lack awareness and knowledge of environmental education; that the technical and vocational curricula, in most cases, lack an environmental dimension; and training institutions usually lack both facilities and expertise to introduce environmental education in their courses". The present project is aimed at addressing such deficiencies, at least as far as South Australia is concerned.

What are the project's aims?

The final details of the project are currently being negotiated with staff within SA DETAFE. Nevertheless the broad purpose of the project is to identify the scope of, and opportunities for, vocational education programs in environmental management and ecologically sustainable development in the SA Vocational Education Training sector by:

(i) identifying and obtaining information on state, interstate, national and international approaches to vocational education in the area; and

(ii) conducting an analysis of the occupational framework to determine employment opportunities in the area for which vocational education projects could be developed.

(iii) defining the current and emerging market needs for vocational education and training courses in environmental monitoring, including programs at the technicians or para-professional level, and modules which might be added to other courses.

Resulting from consultations with Dr Geoff Wood (Director Curriculum Studies) the exit point for NCVER participation should occur after 'clients, client needs and occupational frameworks' have been completed.

How will the project be done?

The project will be conducted over the next 6-9 months. Those principally involved from the NCVER will be Hugh Guthrie and Janine Cesnich. Other Centre staff will be deployed if and when required. The project allows for 6 months equivalent full time** by one of our staff costed at our commerical rate (in simple terms, this means about 120 days).

The steps of the project are outlines in Figure 1. Each is discussed briefly.

Initial consultations

The project has been discussed with the Director of Curriculum for DETAFE (Dr Geoff Wood) and Dr Barbara Radcliffe (Regency Institute - Port Adelaide campus). In addition, the project has been considered at three meetings of an environmental management interest group (two at

Port Adelaide's campus and the other at Regency Institute). One informal meeting has also been held with Graham Adams from the South Australian Department of Environment and Natural Resources.

These initial consultations will be used to finalise this project brief.

Formation of the reference group

A reference group for the project needs to be formed and meet as a matter of priority. The make-up of such a reference group requires careful consideration, but might include:

- a representative from TAFE
- relevant state government department(s)
- local government
- a representative from the MFP
- EPA licensed and non-licensed industry (including manufacturing, rural/horticulture, mining, other...)
- environmental consultancy

The reference group should be small and select, with its primary focus being a pragmatic approach to environmental issues. The group will not necessarily be representative; it will be used to:

- provide general but broadly focused advice to the project and its approach;
- help to formulate and form the variety of advisory groups used during the consultation process;
- provide feedback on project products (ie. Issues papers, frameworks, report etc.); and
- monitor project progress.

Conduct literature review, review other projects and gather relevant documentation

Appropriate literature will be gathered and reviewed. This information will be used:

- to inform the project officers and gain a variety of perspectives
- (as appropriate) in relevant issues papers
- in final reports or other project documentation.

As far as possible the project officers will gather relevant information (including curriculum documentation and reports) from vocational education agencies and other appropriate organisations and groups. In addition, job advertisements will be monitored in order to gather relevant job profiles and specifications.

Development of issues papers

It is proposed that two initial issues papers be developed. These will be used as:

- a means of consolidating the project officers' thinking on a range of issues;
- a basis for consultation and issues clarification with a range of interest groups and other interested parties; and (possibly)
- a basis for developing DETAFE policy on environmental management.

One paper will develop and discuss a definition of environmental management. The other will attempt to identify and describe the potential range of client groups and their various needs.

The consultation process

Consultations will be held with a range of individuals and interest groups identified by

- the reference group
- through the issues paper; and
- other appropriate processes.

A variety of advisory groups with specific identified expertise and interest will be formed. The consultations themselves will take place using the issues papers, and through an appropriate mix of individual interview (using a range of interview schedules)and focus groups.

The outcomes of the consultation process will be consolidated and feedback provided to the reference group. Appropriate feedback will also be provided to those consulted.

Clients, client needs and occupational frameworks

The outcomes of the consultation and review processes will be brought together at this stage (together with information outlined in the issues papers) to:

- outline the range of clients and client groups;
- outline broadly, the training needs of these groups; and
- propose the occupational framework as a basis for program development.

Program framework

The occupational framework and client needs will be used as a basis to propose the way in which client's needs could be met (for example) by a range of module components, modules, short and accredited courses at a variety of levels which will cover (for example) introductory or awareness subjects, knowledge and skill subjects from operative to paraprofessional levels as well as suitable programs for managers. The issue of articulation to the professional programs offered by universities may also need to be addressed.

A plan of action

A final component of the project may include a plan of action to implement the arrangements. Such a plan may be developed by appropriate consultative arrangements, including group process techniques.

A final note on methodology

The project outlined here is an ambitious one. It has been developed to provide an overall strategy, but with a variety of 'exit' points. The exit point ultimately chosen will be in consultation with DETAFE staff and the reference group. It will be guided both by the NCVERs staff time needed to achieve particular outcomes as well as DETAFE priorities.

Appendix 3

Consultations

Consultations

The researchers would like to thank the following people who participated in the consultation process:

Mr Rick Underdown
Department of Primary Industry - Forestry

Dr Ian Radbone
Department of Environment and Natural Resources (DENR)

Mr Ric Bierbaum (a special thanks for his assistance throughout the course of the project)
Local Government Training Authority (LGTA)

Ms Louise Rose
Local Government Association

Ms Leanne Burch
Environmental Protection Authority (EPA), Policy and Planning Branch

Ms Trudi McDonald
SA Economic Development Authority

Ms Liz Casha
SADETAFE

Mr Tony Dodson
SADETAFE

Mr Colin Daly
Workcover

Mr Leigh Miller
Country Fire Service

Ms Lawrie Stanton
Port Adelaide Environmental Resource Centre

Mr David Bennett
The Volunteer Centre

Mr John Smith
Australian Environmental Education Association

Mr Wayne Phillips
Engineering & Water Supply - General

Mr Richard Stasiak
Engineering & Water Supply, Trade Wastes

Mr Ian Fiddian
Chamber of Commerce

Mr Ivan Winter
Environmental Protection Authority - Training

Mr Craig Steel
SA Health Commission

Mr Steve West
Department of Environment and Natural Resources - Water Resources

Mr Dilip Chirlmuley
University of South Australia

The researchers would also like to thank the numerous other people who assisted us during the course of the project, including those we spoke to by telephone and those who sent material/reports and so on.

Appendix 4

Environmental management training needs questionnaire

Environmental management training needs questionnaire: A graduates' perspective

NCVER

NATIONAL CENTRE FOR VOCATIONAL
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Environmental management training needs questionnaire

Environmental management training needs questionnaire

Political and social pressures

1 Environmental management is increasingly becoming an issue, or at least a component, of many jobs. Is this true of your organisation?

Strongly agree	Agree	Disagree	Strongly disagree	No opinion
☐	☐	☐	☐	☐

2 In October 1993, the South Australian Government passed the Environment Protection Act. It is intended that this Act will come into operation later this year. Are you aware of this legislation?

Yes ☐ No ☐

3 What impact, if any, do you feel such legislation will have on your organisation?

Extremely strong impact	Strong impact	Some impact	Slight impact	No impact
☐	☐	☐	☐	☐

4 Which 'environmental' Acts, if any, currently impact on your organisation? *(please specify)*

.....

.....

.....

5 The public is becoming increasingly aware of issues in environmental management, for example, increased public support for policies and action in this area. To what extent are such social pressures impacting on your organisation?

Extremely strong impact	Strong impact	Some impact	Slight impact	No impact
☐	☐	☐	☐	☐

6 Do you feel that social/political pressures will impact on the **number** of people needed with environmental management skills in your organisation?

None needed	Fewer people needed	More people needed	Many more people needed	No change in numbers needed
☐	☐	☐	☐	☐

Roles and responsibilities for environmental management

7 Does your organisation employ an environmental manager?

Yes ☐ No ☐ *(If no, go to Q9)*

8 If so, can you briefly outline some of the major tasks this person is required to perform? *(It would be greatly appreciated if duty statement(s) could be attached)*

.....

.....

.....

.....

9 If your organisation does not have an environmental manager who then, if anyone, has the **predominant** responsibility for ensuring that the organisation complies with environmental legislation and minimising environmental harm? *(If no, go to Q11)*

.....

.....

.....

.....

10 What major tasks is this person(s) required to perform? *(If more than one person has this responsibility, please provide information for each. Attach a duty statement also if possible).*

.....

.....

.....

.....

.....

Volunteers

11 Does your organisation rely on the services of volunteers?

Yes ☐ No ☐ *(If no, go to Q15)*

12 Is it important for 'volunteers' to be trained in the area of environmental management? *(please tick (✓) one box only)*

Extremely important	Very important	Important	Neutral	Not very important	Not at all important
☐	☐	☐	☐	☐	☐

13 To what extent would your organisation be in a position to support the training of volunteers.

To a great extent	To some extent	To a very small extent	Not at all	Don't know
☐	☐	☐	☐	☐

14 Please specify what the main role of these volunteers are, what environmental management training they may require and how many would require such training?

Volunteer's role	Area(s) of training required	Approx. no's requiring training

Environmental roles and training needs

15 In questions 7-10 we explored the areas of responsibility and associated training needs of employees who have the predominant environmental management responsibility (eg. environmental managers). Apart from these employees, who else, if anyone, in your organisation has an environmental role? What role do such employees have and what specific types of training do they require, if any, now and in the future?

Position AND environmental management role	Area(s) in which training required	Approximate no's requiring training
Managers *ROLES*	....	....
Professional *ROLES*	....	....
Administrative *ROLES*	....	....

Table continued next page

Q15 (Cont'ed)

Position AND environmental management role	Area(s) in which training required	Approximate no's requiring training
Technical *ROLES*	....	....
Operative *ROLES*	....	....
Other *(please specify)* *ROLES*	....	....

16 From your list in Q15, indicate which occupational groups, if any, are not well served at present, in terms of availability of training in environmental management? *(please indicate your priority)*

.....

.....

.....

.....

Consultants

17 Does your organisation employ the services of an outside organisation to provide advice in the area of environmental management *(eg. consultants)*?

Yes ☐ No ☐ *(If no, go to Q19)*

18 In which areas do they provide advice *(eg. environmental law)*?

.....

.....

.....

Training issues

19 If you had to prioritise training needs in your organisation, approximately where would environmental management fit?

In the top five training priorities	In the range 5-9	In the range 10-14	In the range 15-19	Not in the top 20 training priorities
☐	☐	☐	☐	☐

20 Does your organisation provide any in-house training for employees in the 'environmental' area?

Yes ☐ . No ☐ *(If no, go to Q22)*

21 If so, in what area(s) is training provided? At what level(s) is the training pitched and how is the training provided? *(Please attach another page to the questionnaire if you cannot fit all the information in the space below)*

Area(s) training provided	Level(s) of staff trained	How training is provided
eg. Environmental awareness	**Management**	**2hr in-house training session**

22 What is the most common method for employees within your organisation to receive information about environmental issues? *(Tick (✓) as many as apply)*

Formal award courses*	Pamphlets	Word of mouth	Short courses#
☐	☐	☐	☐

On-the-job	Seminars/ conference	Video	Other (please specify)
☐	☐	☐	.....

(Eg. normally 1-2 years+ leading to a qualification. # Eg. 1-2 days, or 1-2 weeks)*

23 Which training provider do you feel would be most appropriate to provide training in environmental management for the following employee groups? *(Please tick (✓) the appropriate boxes)*

Employee group	Uni's	TAFE	Private educational providers	In-house	Other *(please specify)*.....
Management					
Administrative					
Professionals					
Technicians					
Operatives					
Other					

24 In what areas do employees in your organisation require training in environmental management? What do you feel would be the most appropriate length for such a course? How should such a course be delivered and by whom? Where should the course be delivered?

Employee group	Area training required	Day or evening	Level of course *(eg. certificate)*	Approx. length of course	Delivery mode *(eg. videos, workbooks)*	Provider	Venue
eg. Operatives	Pest control	Day	Non-award	2 days	Face-to-face	TAFE	On-site

25 Can workers in your organisation conveniently access a TAFE centre?

Yes ☐ No ☐

26 If there isn't a TAFE centre conveniently located near your organisation, what sort of training delivery would be most suitable for workers within your organisation?

.....

.....

.....

27 To what extent would your organisation be in a position to support this training?

To a great extent	To some extent	To a very small extent	Not at all	Don't know
☐	☐	☐	☐	☐

28 If you are currently using the services of an education provider (as opposed to in-house training) for environmental management training, please indicate how satisfied you are with this training? *(Please place one tick (✓) against each provider)*

Provider	Extremely satisfied	Very satisfied	Satisfied	Not satisfied	Not at all satisfied	Not applicable/ don't use
University						
TAFE						
Private education provider						
Others *(please specify)*.....						

Your organisation

29 What is the main activity of your organisation?

.....

30 Approximately how many people are employed by your organisation in South Australia?

1-5	6-9	10-19	20-49
☐	☐	☐	☐

50-99	100-499	500+
☐	☐	☐

31 Please list the postcode(s) of the workplaces operated by your organisation.

eg. 5068.. ....

32 What is your job title? .....

This questionnaire is, of course, confidential. However, if you are interested in assisting us with further input we would appreciate it if you could provide us with the following contact details.

Your name ..... Contact number .....

Your organisation .....

NCVER

A C N 007 967 311

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Environmental management training needs questionnaire

A graduates' perspective

135

Environmental management training needs questionnaire: A graduates' perspective

1 What year did you complete your most recent land management/ horticulture/environmental health TAFE course? 1 9 ☐ ☐

2 What award did you complete? .....

3 What were the major subject(s)/topic(s) studied (or major area of study)?

.....

4 What were your main reasons for undertaking the course? *(Please rank only those you feel were important reasons) [1 being of highest importance]*

To get a job		Try for a different career	
Requirement of my job		Get into another course	
Get a better job or promotion		Other *(please specify)*	
Get extra skills for present job			

5 Do you intend to undertake any further study? *(Please tick (✓) one box only)*

Yes ☐ No *(If no, go to Q8)* ☐

6 If yes, where do you intend to study? *(Please tick (✓) one box only)*

TAFE ☐ University (please specify) ☐ ..... Other (please specify) .....

7 In what subject area do you intend to study (or name of course)? .

.....

8 Are you currently in paid employment? *(Please tick (✓) one box only)*

Yes ☐ No *(If no, go to Q28)* ☐

9 Do you work on a full-time, part-time or casual basis? *(Please tick (✓) one box only)*

Full-time ☐ Part-time ☐ Casual ☐ Other (please specify) .....

10 What occupation (from the list below) do you consider best describes your present job? *(Please tick (✓) one box only)*

Manager		Operative	
Professional		Clerk	
Administrative		Salesperson	
Technical		Other *(please specify)*.....	

11 What is your job title?

.....

12 How long have you held this position? *(Please tick (✓) one box only)*

Less than 6 months	6-11 months	1-2 years	3-5 years	6-9 years	10+ years
☐	☐	☐	☐	☐	☐

13 Do you work in the public or private sector? *(Please tick (✓) one box only)*

Public	Private
☐	☐

14 Which industry do you consider yourself to be employed in? *(Please tick (✓) one box only)*

Agriculture		Transport & storage	
Mining		Communication/information technology	
Manufacturing		Finance, property & business services	
Electricity, gas & water		Public administration & defence	
Construction		Community services	
Wholesale, retail & trade		Recreation, personal & other services	
Other *(please specify)*			

15 How relevant is your latest TAFE qualification to your present job? *(Please tick (✓) one box only)*

Extremely relevant	Very relevant	Relevant	Not very relevant	Not at all relevant
☐	☐	☐	☐	☐

16 How well regarded do you think your latest TAFE course of study is by your employer? *(Please tick (✓) one box only)*

Extremely well regarded	Very well regarded	Regarded	Not very well regarded	Not at all regarded
☐	☐	☐	☐	☐

17 Environmental management is increasingly becoming an issue, or at least a component, of many jobs. Is this true of your position? *(Please tick (✓) one box only)*

Strongly Agree	Agree	Disagree	Strongly Disagree	No Opinion
☐	☐	☐	☐	☐

18 Is this true of others in your organisation? *(Please tick (✓) one box only)*

Strongly Agree	Agree	Disagree	Strongly Disagree	No Opinion
☐	☐	☐	☐	☐

19 Does your position require you to have an understanding of environmental issues (ie. management of the environment)? *(Please tick (✓) one box only)*

Yes ☐ No *(If no, go to Q21)* ☐

20 Please outline the main tasks your position requires you to perform and/or highlight the environmental components of your position.

.....

.....

.....

.....

.....

21 Does your organisation provide any on-the-job training in the area of environmental management? *(Please tick (✓) one box only)*

Yes ☐ No *(If no, go to Q23)* ☐

22 In what areas is on-the-job training provided, at what levels and how?

Area(s) training provided	Level(s) of staff trained	How training is provided
eg. Environmental awareness	**Management**	**2hr on-the-job training session**

23 What is the most common method for employees in your organisation to receive information about environmental issues? *(Tick (✓) as many as apply)*

Formal award courses *	Pamphlets	Word of mouth	Short courses#
☐	☐	☐	☐

On-the-job	Seminars/ Conferences	Video	Other *(please specify)*
☐	☐	☐	.....

**eg. normally 1-2 years+ leading to a qualification/#eg. 1-2 days, or 1-2 weeks*

24 Which training provider do you feel would be most appropriate to provide training in environmental management for the following employee groups? *(Please tick (✓) the appropriate boxes)*

	Training Providers				
Employee group	Uni's	TAFE	Private education providers	In-house (employer) provision	Other *(please specify)*.....
Management					
Professionals					
Administrative					
Technicians					
Operatives					
Other					

25 In what areas (if any), do you feel, employees within your organisation require training in the area of environmental management which might be delivered by an external provider (not employer provided training)?

Employee group	Area(s) in which training required	Provider	Approx. length of course	Day or evening	Level of course
eg. Operative	**Pest control**	**University**	**1 week**	**Evening**	**Certificate**

26 Do you feel that your employer would be in a position to support this training (eg. time off, financial support etc)? *(Please tick (✓) one box only)*

To a great extent	To some extent	To a very small extent	Not at all	Don't know
☐	☐	☐	☐	☐

27 Please give the postcode of your workplace

☐ ☐ ☐ ☐

28 If you are not currently in paid employment, are you *(Please tick (✓) one box only)*:

Unemployed	Studying	A volunteer
☐	☐	☐

29 If you are a volunteer, how important is it for 'volunteers' to be trained in the area of environmental management? *(Please tick (✓) one box only)*

Extremely important	Very important	Important	Neutral	Not very important	Not at all important
☐	☐	☐	☐	☐	☐

30 Please specify what your main role as a volunteer is, and what environmental training you (and the other volunteers you work with) may require.

Volunteer's role	Area(s) training required

This questionnaire is, of course, confidential. However, it you are interested in assisting us with further input, we would appreciate it if you could provide us with the following contact details.

Your name.....

Contact number.....

Your organisation.....

Thank you for your assistance.

Appendix 5

Environmental roles and training needs: Who in an organisation has the environmental role?
What role do they have?
What training do they need?
How many need to be trained?

Managerial

Main activity	Role	Training need	No. needing training
Local government	Managerial	Environmental awareness	
Local government	Managerial	Overview in all areas relating to environmental management	1
Local government	• Town planner • Works overseer	• Environmental management/technical training • Total training	
Local government	• Town clerk • Deputy town clerk • Community services manager	• Awareness of Act and implications of it • Technical knowledge	
Local government	• City manager • City engineer	• Principles of environmental management • Strategic planning in context for environmental management • Community involvement	2 2
Local government	Operations	• Stormwater disposal • Marine environment • Water quality	2
Local government	• Engineering • Town planning	General awareness of legislative responsibilities	4
Local government	• Envirolink GM • Supporting staff	Waste management	2
Local government	Policy making	General environmental understanding and pragmatic attitudes, also looking at cost saving and profit making	8
Local government	City manager	EPA legislation	1
Local government	• Engineering • Planning • Environmental health	General issues only	3
Local government	Managers	Awareness, understanding of environmental sustainable development	4
Local government	CEO	General environmental issues	1
Local government	• General administration • Works	General overview of all legislation impacting on local government	2
Local government	• City engineer • Sr Planning officer • Chief EHO	General environmental management	3

Managerial

Main activity	Role	Training need	No. needing training
Local government	CEO	Legislative requirements/responsibilities	1
Local government	Manager	Responsibilities of council under various Acts	2
Local government	• CEO • Deputy CEO • Works manager • Building/planning	Environmental awareness/responsibilities of organisation	4
Local government	Environmental services manager	• Building • Food • Health • Housing • Plumbing • Communication • Problem solving • Planning	
Local government	Coordination of environmental issues for council and town planning	• Coastal management • EPA • Catchment water management • River care • Aboriginal heritage	1
Local government	• Works manager • Assistant works manager • Chief inspector	• Waste management • Effluent disposal	3
Local government	Environmental services manager	All areas	1
Local government	• CEO • Director corporate services	General	2
Local government	Works manager	Roadside vegetation management	1
Local government	• Development • Engineering • Recreation	• Ongoing familiarisation with new legislation • Pest control • Use of hazardous chemicals • Plant identification	2 1
Local government	Development control	• Water management • Meteorology • Horticulture and landcare	1
Local government	• Works manager • Chief environmental health officer	Broad knowledge of environmental issues across the board	2
Local government	Overseer of works	Environmental issues considered within roadmaking operations	3

Managerial

Main activity	Role	Training need	No. needing training
Manufacturing (Smallgoods)	Managerial	Environmental industrial waste	3
Manufacturing	Environmental manager	Auditing Contaminated site assessment & remediation Dangerous substance - storage, handling, transport Legislation	1
Manufacturing (Pharmaceutical)	Operational manager Manufacturing manager	Overview over **relevant** environmental law, which affect daily operations	2
Manufacturing (Chemical)	Managerial	For area of responsibility	50
Manufacturing (Mineral fertilisers)	Production operations	Various Act compliance	2
Manufacturing (Technical rubber)	Board of directors	More written documentation in legible fashion - interpretation to conduct business	4
Manufacturing (Fruit juice)	Factory manager	Awareness of the Act and how to apply it	1
Retail (Fuel/oil)	Legislative function	Keep up-to-date with new government Acts etc. and pass on to sales	
Retail (Paint)	Managerial	Dangerous goods legislation Health hazards Environmental hazards	
Engineering/building/ construction	Engineering manager Works manager Weaving manager Hemming manager	Legislation and regulations Environmental regulations specific to noise, trade waste, air emissions, dangerous goods	8
Engineering/building/ construction	Managerial	Awareness of environmental requirements	3
Engineering/building/ construction	Managerial	Determination of waste handling and practical solutions to resolutions	4
Engineering/building/ construction	Executive officer Construction manager	Environmental issues Contaminated land	5

Managerial

Main activity	Role	Training need	No. needing training
Engineering/building/ construction	Responsible for meeting the goals and objectives of the organisation	Broad environmental issues and responsibilities relevant to the organisation	
Engineering/building/ construction	Managerial	Risk assessment/evaluation Reporting Audits Environmental impact analysis	1
Farming and grazing	Pasture improvement Water control	Water control	1
Farming and grazing	Managerial	Wastewater and underground water monitoring	2
Pest/weed control/management	Company policy - formulation	Assistance in the understanding of the bureaucratic information - summarise and condense it	
Pest/weed control/management	Management	Environmental legislation	1
Winemaking/grapegrowing	Manager/winemaker	Awareness of details of new Act	1
Winemaking/grapegrowing	Vineyard manager Winery manager General manager Proprietor	Full knowledge of the Act and implications relative to the work areas ie. 'vineyard and the environment', 'winery and the environment'	4
Winemaking/grapegrowing	Manager	Waste control and management	1
Winemaking/grapegrowing	Cellar Bottling Services Administration	General environmental management including technical 'hands-on' skills	25
Professional Association	Carry out the association's environmental policies in the states in which they operate	Environmental law Technical matters Best practice	1
Professional Association	Parks managers Recreation managers	Staff management Computer usage Problem solving	100
Health care	Clinical nurse Consultants Quality managers Supervisors Area managers Maintenance engineers Staff development	Adherence to hospital environmental policy Compliance with Acts or codes of practice/legislation	21

Managerial

Main activity	Role	Training need	No. needing training
Health care	Supply General services Engineering	Recycling Purchasing Energy	3
Petroleum production/ distribution	Depot manager Managers	Spill clean up Maintenance of equipment Records of 'due care' actions Due care concepts and recording	3
Petroleum production/ distribution	Policy Guidelines Task setting	Short courses in legislative requirements, government guidelines etc.	2
Petroleum production/ distribution	Gas plant managers Seismic managers Drilling managers Divisional managers	Legal	6
Petroleum production/ distribution	Branch managers in all areas (exploration, regulation, monitoring, survey, public relations, administration, groundwater management)	Development of the concept of an integrated environmental management system which is as much a part of work as safety, health and finance etc	20
Petroleum production/ distribution	State responsibility for environmental standards	General outline of regulatory requirements	1
Petroleum production/ distribution	District manager Engineer in charge	Compliance with the local Acts	3
Conservation/ environmental protection	Policy and planning Industry services Recycling and waste	Strategic planning Negotiating for environment improvement programs Public speaking Media skills OH&S welfare	12
Motor vehicle repairs/fuel retailer	Manager	Update of all responsibilities in relation to any areas of environmental controls in our industry	1-2
Environmental consultants	Director	Management financial control Contract law Keyboard skills	1
Environmental consultants	Project managers	Management of environmental contamination, investigation and clean up projects	2
Natural resource management	Field operatives	All areas	Dozens

Managerial

Main activity	Role	Training need	No. needing training
Wastewater treatment/ disposal	Environmental compliance	Environmental legislation/awareness	4-5
Project management	Director	Awareness of company obligations (Board) - legal requirements	1
Scientific (Diagnostic)	Managerial	Understanding of new legislation	1
Mineral/gas exploration	Ensure field operations are within environmental guidelines	Knowledge of environmental legislation	2
Mineral/gas exploration	Manager	Familiarity with Act	1
Mineral/gas exploration	Environmental radiation officer	Financial and budgeting Human resources Environmental audit	1
Mineral/gas exploration	Mine/operations manager	Compliance requirements Advances in rehabilitation and environmental management technology	3-4
Water management	Managers	All areas	2
Water management	Managers	Water management Soil management	1
Forestry	Managers	Understanding of Acts and regulations Understanding of ESD principles and biodiversity issues	
Abattoir	Managers	More training in awareness of ever burgeoning government legislation	2
Training and education	Mangers	Organisational management Office management	3
Land management	Portfolio - land management	Requirements for provision of essential services	1
Milk processing	Production supervisors	Environmental legislation Environmental auditing	8
Tanning	Manager	Tannery waste effluent	1

Professional

Main activity	Role	Training need	No. needing training
Local government	Professional	General knowledge	
Local government	Environmental health officers	• Contaminated land assessment • Water sampling • Pollution control • Waste disposal • Environmental auditing • Supported residential accommodation • Hazard analysis • Risk assessment • Computing skills • Submission writing • Applying for grants • Public speaking and communication	4
Local government	• Sr building/health inspector • Planning/building inspector • Planning officer	• Environmental management/technical training • Technical training	
Local government	General inspector	• General training • Public relations • Report preparation • Technical information • Act interpretation	
Local government	• Planning officer • Technical officer • Works supervisor	• Principles of environmental management • Environmental principles at work • Integrating environmental management into daily tasks & existing programs	
Local government	• Engineers • Town planners	General awareness of legislative responsibilities	4
Local government	• Planning officers • Building officers • Engineers • Health surveyors	• Planning • Building control • Stormwater disposal • Health	3 3 4 2
Local government	• Development officer • Works supervisor	• General environmental understanding • Flexible thinking to come up with solutions for existing and new issues	
Local government	• Sr EHO • EHO • Sr Development officer • Planning officer	EPA legislation	4
Local government	Trainees and cadets	General issues only	2

Professional

Main activity	Role	Training need	No. needing training
Local government	Works manager	Environmental issues relating to works and services	1
Local government	• EHO • Works manager	• EPA • Healthy catchment • Coastal management	2
Local government	• Investigation • Reporting • Recommendations	Extension of existing qualifications	1
Local government	Environmental health officer	All areas	1
Local government	Director of engineering services	General	1
Local government	• Planners • Health surveyors • Engineers • Horticulturalists	• Ongoing familiarisation with new legislation • Pest control • Use of hazardous chemicals • Plant identification	10
Local government	Environmental health	• Noise quality • Air quality	1
Local government	Environmental health officer	Broad knowledge of environmental issues across the board	1
Local government	Planning officer	Ongoing environmental awareness training	1
Manufacturing	Environmental officer Environmental assistant	Auditing Dangerous substance - storage, handling, transport Legislative compliance Sampling Monitoring	1
Manufacturing (Pharmaceutical)	Project engineer	Overview over **relevant** environmental law, which affect daily operations	4
Manufacturing (Chemical)	Professional	For area of responsibility	50
Manufacturing (Technical rubber)	Industrial chemist	Detail of biological information or access to it	1
Engineering/building/ construction	Engineers	Awareness of environmental requirements	10
Engineering/building/ construction	Professionals	Awareness of regulations	
Engineering/building/ construction	Construction engineer	Environmental issues Contaminated land	1

Professional

Main activity	Role	Training need	No. needing training
Engineering/building/ construction	Responsible for interpreting environmental aspects into their work areas	Broad environmental issues and specific aspects relevant to their particular work area eg. planning, design, construction maintenance	
Engineering/building/ construction	Professional	Risk assessment/evaluation Reporting Implementation of programs	3
Winemaking/grapegrowing	Professional	Winery waste OH&S Chemical usage	
Winemaking/grapegrowing	Winemakers	Environmental management systems (ie. some technical education)	2
Professional Association	Parks managers Recreation managers	Awareness of state of the art management techniques in environmental management relating to parks and other recreation areas	100
Professional Association	Environmental health officers	Waste minimisation Stormwater treatment and disposal Assessing water, air and soil contamination/pollution Risk assessment Risk management Environmental auditing	250
Consulting engineers	Environmental engineers	Environmental management generally Environmental law/liabilities Environmental auditing BS7750 and related standards Legislation/standards/regulations	4
Health care	Laboratories	Chemical effects on the environment	6
Health care	Trainers	OH&S relating to environmental issues ie. hygiene measurements	3
Health care	Medical Nursing Laboratory	Medical waste	10
Petroleum production/ distribution	Minimising disturbances Rehabilitation Training	Procedures for carrying out manual exploration by minimising ground disturbances and then carrying out appropriate land rehabilitation	3
Petroleum production/ distribution	Engineers Operational staff	Physical environmental management	2-4 1-2
Petroleum production/ distribution	Professional	Development of the concept of an integrated environmental management	100

Professional

Main activity	Role	Training need	No. needing training
Conservation/ environmental protection	Pollution measurement Water monitoring	Environmental sciences Environmental law Environmental ethics Public speaking Media skills	8
Environmental consultants	Environmental subcontractors	Keyboard skills Specific skills to subcontractors	
Natural resource management	Scientific	All areas	Dozens
Project management	Project managers	Detailed awareness of environmental Acts	2
Scientific (Diagnostic)	Provide advice to clients re: managing stock/ residues harmful to humans and animals	Understanding of new legislation particularly in relation to intensive and extensive livestock production, organic and inorganic residues, affecting health of animals and humans	5
Mineral/gas exploration	Geologists	Familiarity with Act Implementation of provisions	3
Mineral/gas exploration	Botanist Environmental chemist Environmental officer Environmental physicist Ecologist Horticulturalist	Computer software usage Plant taxonomy Quantitative monitoring Updating techniques Vegetation identification Radiation protection Waste treatment Ecological research and impact monitoring	5
Mineral/gas exploration	Exploration geologists Site environmental coordinators	Compliance requirements Advances in rehabilitation and environmental management technology	3-4
Water management	Ensure long-term sustainability of horticultural soils	Water management Soil management	3
Developers	Project managers Project engineers	Environmental issues - general Environmental audit Environmental site management	6
Forestry	Professionals	Understanding of impact environmental issues are likely to have on operations	
Education and training	Professionals	Curriculum development Community environmental education Communication	9
Milk processing	Human resource manager	Environmental legislation Environmental auditing	1

Administrative

Main activity	Role	Training need	No. needing training
Local government	Administrative	Process control	
Local government	Clerical officer	Brief overview of: • Contaminated land assessment • Water sampling • Pollution control • Waste disposal • Environmental auditing • Supported residential accommodation • Hazard analysis • Risk assessment • Computing skills • Submission writing • Applying for grants • Public speaking and communication	2
Local government	Administration officer	Technical training	
Local government	Depot clerk	• General training • Public relations • Report preparation • Technical information • Act interpretation	
Local government	Planning/building clerk	Introduction to legislation	
Local government	Environmental services manager	Environmental planning	1
Local government	Clerical	Awareness of legislative requirements	10
Local government	Sr Administration officer	• EPA • Coastal management	1
Local government	Secretary	All areas	1
Local government	Rates and property officer	General	1
Manufacturing (Chemical)	Administrative	Awareness of policy and procedures	40
Manufacturing (Technical rubber)	Accountant	Regular detailed information and changes there to	1
Manufacturing (Fruit juice)	Company secretary	Aware of the Act	1
Engineering/building/ construction	Accountants Costing Sales	General environmental protection awareness Recycling of paper waste	20
Engineering/building/ construction	Administrative	Management of subcontractors	4
Consulting engineer	Administration manager	General OH&S	

Administrative

Main activity	Role	Training need	No. needing training
Health care	Administration and support services	Waste disposal Waste minimisation	3
Health care	Administrator Director of nursing	Compliance with Acts or codes of practice, legislation	2
Petroleum production/ distribution	Lawyer	Physical environmental management	1
Petroleum production/ distribution	Administration	Development of the concept of an integrated environmental management system	50
Conservation/ environmental protection	Licensing of industry Ozone substances Training & education	Information technology Integrated licensing systems Interpersonal relation skills	8
Water management	Administrative	Legislative	2
Environmental resource centre	Collection and dissemination of information	Computer skills Library skills	2

Technical

Main activity	Role	Training need	No. needing training
Local government	Works supervisor	Broad knowledge of environmental issues across the board	2
Local government	• Parks and gardens supervisor • Works supervisor • Sr Building inspector	Ongoing environmental awareness training	3
Manufacturing (Pharmaceutical)	Maintenance people	Overview over **relevant** environmental law, which affect daily operations	4
Manufacturing (Chemical)	Technical	Area of responsibility described by job description and operating procedures	50
Manufacturing (Technical rubber)	Maintenance engineering	Written regular information or on the job training	2
Engineering/building/ construction	Textile technologists Engineers/ind QA	General environmental protection awareness and specialised course on specific environmental issues	15/20
Engineering/building/ construction	Responsible for incorporating environmental aspects into their work areas	Specific aspects relevant to their work areas	
Pest/weed control/management	Technical officers	Environmental legislation re: toxic products	3
Winemaking/grapegrowing	Vineyard manager	Pesticide safety Weed control Weed control legislation	
Winemaking/grapegrowing	Technical	Vineyard chemicals Waste treatment	
Winemaking/grapegrowing	Engineers Fitter and turners Electrician Boiler maker	Principles and methods looking at not only waste disposal but also ways of minimising waste production or alternatives there of	20
Health care	Lung function technician Tradesmen Cooks	Compliance with Acts or codes of practice, legislation	9
Petroleum production/ distribution	Sales	Hazardous products - control & response	5
Petroleum production/ distribution	Minimising disturbances Rehabilitation	Require training in common sense simple procedures to minimise ground disturbances and then to carry out appropriate land rehabilitation	1
Petroleum production/ distribution	Technical	Development of the concept of an integrated environmental management system	50

Technical

Main activity	Role	Training need	No. needing training
Local government	Technical	Measurement techniques	
Local government	General inspectors	• Contaminated land assessment • Water sampling • Pollution control • Waste disposal • Environmental auditing • Supported residential accommodation • Hazard analysis • Risk assessment • Computing skills • Submission writing • Applying for grants • Public speaking and communication	3
Local government	Works depot staff	Technical training	
Local government	Technical officer	Introduction to legislation	1
Local government	• Operations • Environmental health • Planning • Parks & gardens	• Stormwater disposal • Marine environment • Water quality • Contaminated land • Rehabilitation • Waste disposal	4
Local government	• Technical officers • Planning inspector	General awareness of legislative responsibilities	4
Local government	• Engineering • Planning • Health	• Stormwater control • Building design • Waste disposal • Clean air • Noise control	2 3 2
Local government	• Supervisors • Trainees and cadets • Pest plant control	General overviews only	3
Local government	Technicians	• Awareness, understanding of environmental sustainable development • Specific training dependent on their specialist training area	15
Local government	Works supervisor	• Waste management (dumps) • Stormwater management • Roadside vegetation management	4
Local government	Technical	Septic tank inspection and administration	1
Local government	• Engineering designers • Planning inspectors	Ongoing familiarisation with new legislation	

Technical

Main activity	Role	Training need	No. needing training
Petroleum production/ distribution	Coordination of corporate and state program	Detailed interpretation of regulatory requirements Environmental management systems Environmental practices	1
Conservation/ environmental protection	New processes in pollution control Existing technology	Training skills Public speaking Industry knowledge Negotiating	15
Motor vehicle repairs/fuel retail	Technical	Further updating in relation to CFCs ie. car refrigeration, recycling etc	1
Environmental consultants	Field officers	Soil testing for environmental contamination Stack emission testing	3
Scientific (Diagnostic)	Supporting professional staff	Understanding of new legislation particularly as it relates to intensive and extensive livestock production, organic and inorganic residues, affecting health of animals and humans	3
Mineral/gas exploration	Laboratory technician Environmental technician	Instrument operation Environmental law	2
Mineral/gas exploration	Supervisors	Compliance requirements Advances in rehabilitation and environmental technology	3-4
Water management	Scientific	Water monitoring and analysis	2
Forestry	Technical	Understanding of Acts and regulations Understanding of ESD principles and biodiversity issues	10

Operative

Main activity	Role	Training need	No. needing training
Local government	Operative	Work procedures	
Local government	• Depot supervisor • Works staff	Introduction to legislation	5
Local government	Parks and reserves	General awareness of legislative responsibilities	4
Local government	• Health surveyors • General inspectors • Engineering construction	• Evidence gathering • Problem resolution • Reporting • Engineering design	9
Local government	Outside work force	General understanding of council's aims and ability to think environmental when doing day to day tasks	8
Local government	Inspectors	Legislative requirements/responsibilities	2
Local government	All employees	Environmental awareness/responsibilities of organisation	6
Local government	Workers 'outside staff'	Roadside vegetation management	4-6
Local government	Horticulturists	Ongoing familiarisation with new legislation	
Local government	Workers	Broad knowledge of environmental issues across the board	6
Manufacturing (Pharmaceutical)	Leading hands Operators	Overview over **relevant** environmental law, which affect daily operations	8
Manufacturing (Chemical)	Operative	Area of responsibility described by job description and operating procedures	50
Manufacturing (Textured coatings)	Manufacturing & distribution	Useful to have an external TAFE awareness course to compliment internal course	6
Manufacturing (Technical rubber)	Process operators	Written regular information in a simplified version or on-the-job training	7
Manufacturing (Fruit juice)	Factory hands	Carry out appropriate environmental procedures	17
Retail (Fuel/oil)	Sales	Provide customers with information re: new legislation etc in order to promote sales	
Engineering/building/ construction	Machine operators Sewing machine mechanics Process machine operators	General environmental protection awareness Specialised courses to their particular areas of machining ie.air emissions, trade waste, noise, asbestos	650

Operative

Main activity	Role	Training need	No. needing training
Engineering/building/ construction	Responsible for incorporating environmental aspects into their work areas	Specific aspects relevant to their work area	
Engineering/building/ construction	Operative	Identification of environmental risks Reporting	5
Winemaking/grapegrowing	Tractor operator	Pesticide safety Weed control	
Winemaking/grapegrowing	Operative	Team appreciation of regulations and requirements	3
Winemaking/grapegrowing	Operative	Vineyard chemicals Waste treatment	
Winemaking/grapegrowing	Cellarhands	Technical aspects of waste disposal methods, rationales, alternatives	30
Health care	Handypersons Nurse assistants Ward clerks Clerical workers Housekeeping	Compliance with Acts or codes of practice, legislation	93
Health care	Porters	General waste, recycling, waste minimisation	5
Petroleum production/ distribution	Drivers	Emergency response requirements	6
Petroleum production/ distribution	Minimising disturbances Rehabilitation	Require training in common sense simple procedures to minimise ground disturbances and then to carry out appropriate land rehabilitation	3
Petroleum production/ distribution	Operatives	Development of the concept of an integrated environmental management system	50
Petroleum production/ distribution	Implementation of environmental procedures, recording	Environmental protection approaches and methods	All on-site operators
Conservation/ environmental protection	Guiding staff	Geology Communication skills Natural history of the region	30
Conservation/ environmental protection	Enforcement Inspection Investigation	Investigative methods Environmental law Short environmental topics OH&S welfare	26
Conservation/ environmental protection	Team leaders Supervisors	Basic understanding in conservation Supervision	

Operative

Main activity	Role	Training need	No. needing training
Natural resource management	Maintenance Rangers Volunteers Others	All areas relating to environmental legislation, management	Dozens
Wastewater treatment/ disposal	Operatives	Environmental legislation/awareness	5-6
Mineral/gas exploration	Field operators	Knowledge of environmental legislation and recommended practice	25
Mineral/gas exploration	Field operators	Familiarity with and implementation of provisions of environmental Act	4
Mineral/gas exploration	Monitoring assistant	Waste management Rehabilitation Computer software usage	1
Mineral/gas exploration	Plant operators	Compliance requirements Good housekeeping and principles of sound environmental practice	10-20
Water management	Operatives	Chemical application Landcare	8
Forestry	Operatives	Understanding of environmental Acts and regulations Understanding of ESD principles and biodiversity issues Understanding of impact environmental issues are likely to have on operations	
Abattoir	Operatives	More training needed in practical aspects of waste disposal	2
Land management	Rangeland officers	Administration Pest control	1
Milk processing	Processors	Legislation Responsibilities Auditing	50

Other

Main activity	Role	Training need	No. needing training
Local government	Council members	Introduction to legislation	6
Winemaking/grapegrowing	All employees	Need for general awareness	
Winemaking/grapegrowing	All staff	General issues of environmental protection	
Health care	Nursing staff	Compliance with Acts or codes of practice, legislation	180
Health care	All staff	Awareness of the Acts and how they affect each manager and indeed all staff	
Conservation/ environmental protection	Park maintenance staff	Chemical safety Biology	3
Natural resource management	Job skills Traineeships		Dozens
Scientific (Analytical)	All employees	The major area of concern is the handling and disposal of controlled substances and hazardous chemicals and biological material	20
Mineral/gas exploration	Aboriginal liaison	Understanding Aboriginal culture Ability to relate to Aboriginal people	1
Providing free trees	All staff	Understanding principles of revegetation, those that affect operation	8

Appendix 6

Environmental roles and training needs: What? Where? When? By whom? How?

Managers

Activity	Training	D/E	Level	Length	Delivery	Provider	Venue
Local government	General environmental overview	D/E		1 week		Industrv/Uni	Onsite
Local government	Broad knowledge of environmental issues	D	N/A	1 day	Face-face	Uni/TAFE	
Local government	• Waste management • Effluent disposal		N/A	3 days	Work-shops	TAFE	Onsite
Local government	General environmental overview	D	N/A	1-2 days	Seminar	LGTA	On-off site
Manufacturer (smallgoods)	Environmental industrial waste	D		1/2 day		TAFE	Onsite
Manufacturer (packaged goods)	Environmental policy	E	N/A	1 day	Face-face	Uni	Onsite
Manufacturer	Legal responsibility	D		1/2 to 1 day	Face-face	Govt/PEP	Onsite
Manufacturer (textured coatings)	Local and national legislation	D/E	Cert.		Face-face	TAFE	Onsite
Manufacturer (health food)	Law	D	N/A	1-2 days	Seminar	TAFE	TAFE
Manufacturer (fertilisers)	Act compliance	D	Cert.	2 days	Face-face	TAFE	Offsite
Manufacturer	Environmental markets	D	N/A	1 day		On-job	Onsite
Manufacturer	Waste management	E	Cert.	2 days	Face-face	PEP	Off site
Retail (paint)	Chemicals: • Dangerous goods legislation • Health hazards • Environmental hazards	D			Face-face	TAFE	
Engineering/ building/ construction	• Contamination • Environmental law	D		4-8 hrs	Face-face/ slides/ videos	PEP	

Managers

Activity	Training	D/E	Level	Length	Delivery	Provider	Venue
Engineering/ building/ construction	Awareness of regulations	E	N/A	1 day	Work-shops	TAFE	TAFE
Engineering/ building/ construction	Environmental acts	D		1 day	Face-face	TAFE/ inhouse	
Engineering/ building/ construction	Awareness of environmental requirements	D		4 hrs	Face-face	PEP	Onsite
Engineering/ building/ construction	• Legislation and regulations • Specific environmental regulations eg. noise, waste etc	D		1-2 wks		External	On-off site
Farming and grazing	All areas				Video/ printed		Onsite
Farming and grazing	Waste water management	D	N/A	1 day	Face-face	Dept Primary Ind.	Onsite
Farming and grazing	• Pest control • Erosion control • Water control	E	Cert.	7 days	Face-face	TAFE	Onsite
Pest control	Disposal techniques	D/E		1 day	Video		Onsite
Winemaking/ grapegrowing	Awareness of details of new Act - general	D		1 day	Seminar	Anyone	Offsite
Winemaking/ grapegrowing	• Full knowledge of the Act and implications • Vineyard and the environment • Winery and the environment	D		1 day	Face-face	PEP	Regional
Winemaking/ grapegrowing	Environmental management systems	D	N/A		Various	PEP	Offsite
Professional association	Parks management issues	D	Cert.	2 hrs own time	Face-face	TAFE	Lecture room & onsite

Managers

Activity	Training	D/E	Level	Length	Delivery	Provider	Venue
Professional association		E	N/A	As req.	Face-face	TAFE	Onsite
Professional association	Time management	D		2 days	Face-face	TAFE	TAFE
Professional association	State of the art technology	E	N/A	2 days	Face-face	TAFE	TAFE
Health care/ safety	• Waste disposal • Waste minimisation		Cert.	Varying	Lecture	TAFE/Uni	Campus
Health care/ safety	• Sewer • Drain protection	D	N/A	2 hrs	Presenta-tion	EWS	Onsite
Recycling/waste	Recycling materials	E	N/A	1 day	Face-face	TAFE	
Recycling/waste	Waste recycling				Video	Inhouse	
Petroleum	Environmental principles	D	N/A	1 day	Face-face	TAFE/Uni/i nhouse	Various
Petroleum	General outline of regulatory requirements						
Petroleum	Legal	D	N/A	1 day	Face-face	PEP	Onsite
Petroleum	Due care concept	D	N/A	1 day	Face-face	PEP	Onsite
Petroleum	Legislation	D	N/A	1 day	Lecture	Inhouse	Onsite
Fisheries	Cost/time	D	N/A	As req.	Work-books/ videos	TAFE	Onsite
State govt. dept.	Most environmental issues			1/2 day	Class-room	Inhouse	Onsite
Conservation	Strategic planning	D	N/A	2 days	Face-face	Uni/PEP	Inhouse
Environmental consultant	Site rehabilitation	D	N/A	4-5 days	Face-face	TAFE/Uni	Offsite
Environmental consultant	Keyboard skills	D	N/A	1 day	Flex.	Unsite	
Wastewater	Liability	D	Cert.	2 days	Video/ face-face	Inhouse/ TAFE	Onsite

Managers

Activity	Training	D/E	Level	Length	Delivery	Provider	Venue
Project management	Site contamination	D	N/A	1 day	Face-face	TAFE	
Project management	Awareness of company obligations - legal requirements					PEP	
Scientific	Understanding new Acts	D	N/A	1 day	Face-face	PEP	Onsite
Scientific	Waste solutions	D	N/A	1 day		PEP	Onsite
Mineral exploration	Environmental compliance	D	N/A	1 day	Face-face	Inhouse	Onsite
Mineral exploration	• Financial & budgeting • Human resources • Environmental audit	D	Vary	Vary	Face-face	TAFE/ PEP/ inhouse	Onsite
Mineral exploration	Environmental laws	D	N/A	1-2 days	Presenta-tion		
Water management	General environmental overview	D			Conf'ce	?	Adelaide
Developers	• Soil quality • Water quality	D		2 days	Face-face	Uni/TAFE	
Fruit growing	Law and legislation					By post	
Milk processing	• Environmental legislation • Environmental auditing	D -	N/A	1 day	Face-face	PEP	Onsite

Managers

Activity	Training	D/E	Level	Length	Delivery	Provider	Venue
Local government	• Awareness • Understanding of environmentally sustainable development	D	N/A	1 day	Face-face	PEP	On-off site
Local government	General environmental overview	E			Face-face	PEP	Onsite
Local government	Legal and general overview	D		2 days	Face-face	TAFE	Onsite
Local government	• Principles of environmental management • Strategic planning in the context of environmental management • Community involvement	D	N/A	1/2 to 3 days	Face-face/ video	Not vital	Not vital
Local government	• Stormwater disposal • Marine environment • Water quality	D	Cert.	5-14 days	Face-face	Uni	
Local government	General awareness of legislative responsibilities	Flex	Flex	Flex	Flex	Flexible	Flex
Local government	General environmental understanding	E		1 day	Video/ Face-face	TAFE/ Other	Onsite
Local government	Environmental issues	D	N/A	1 day	Face-face	LGTA	Regional
Local government	Legislative	D	N/A	1-2 days	Face-face	LGTA	Central
Local government	Legislative	D	N/A		Face-face	TAFE/ PEP	Regional
Local government	• Awareness of the Act and implications • Technical knowledge	D			Face-face	TAFE/ PEP	
Local government	• Environmental management • Policy • Legislation	D	Award	5 days	Work-shops/ lects.	Uni/TAFE	Offsite
Local government	Environmental issues relating to roadmaking	D	N/A	2 day	Face-face	TAFE	Onsite

Professional

Activity	Training	D/E	Level	Length	Delivery	Provider	Venue
Local government	• Awareness • Understanding of environmentally sustainable development • Specific area training	D/E	Post-grad	1-2 yrs	Face-face	Uni.	Off-site
Local government	General environmental overview	D/E		2 days		TAFE	
Local government	Specific environmental issues	D	Cert.	1-2 days	Face-face	TAFE	TAFE
Local government	• Principles of environmental management • Environmental management at work • Integrating environmental management into daily tasks and existing programs	D	N/A	½ to 3 days	Face-face/ video	Not vital -	Not vital
Local government	General awareness of legislative responsibilities	Flex.	Flex.	Flex.	Flex.	Flex.	Flex.
Local government	EPA legislation	D	N/A	1-2 days	Seminar	LGTA	Onsite
Local government	Changes in legislation	D	N/A	1 day	Face-face	AIEH	Central
Local government	• General enviornmental understanding • Waste • Vegetation	D/E		1 day			Onsite
Local government	• General training • Public relations • Report preparation • Technical information • Act interpretation	D			Face-face	TAFE/ PEP	

Professionals

Activity	Training	D/E	Level	Length	Delivery	Provider	Venue
Local government	• Environmental management • Policy • Legislation	D	Award	5 days	Work-shops/ lects.	Uni/TAFE	Offsite
Local government	Environmental auditing	D/E	N/A	Semester	Face-face	Uni/TAFE	Onsite
Local government	• Recycling • Stormwater	D	N/A		Face-face	TAFE	Onsite
Local government	Broad knowledge of environmental issues	D	N/A	1 day	Face-face	Uni/TAFE	
Local government	Upgrading qualifications	D/E	Cert.	Approx. 1 week	Face-face	Uni	Onsite
Local government	Qualifications update		Dipl.		Correp'ce/ Face-face		
Manufacturer	Auditing	D	Cert.	2 days	Face-face	PEP	Onsite
Engineering/ building/ construction	• Energy in road building • Impact of roadworks	D	N/A	1 day	Face-face	Uni/TAFE	Onsite
Engineering/ building/ construction	• Environmental management • Stormwater management • Community consultation	D	N/A	2 days 1 day 1 day	Face-face	Inhouse Inhouse/ external	Onsite
Engineering/ building/ construction	Awareness of regulations	E	N/A	1 day	Work-shop	TAFE	TAFE
Engineering/ building/ construction	Specific details as they relate to the industry	D		1 day	Face-face	TAFE	
Engineering/ building/ construction	Awareness of environmental requirements	D		4 hrs	Face-face	PEP	Onsite
Winemaking/ grapegrowing	Environmental management systems-technical	D	N/A		Various	PEP	Offsite

Professionals

Activity	Training	D/E	Level	Length	Delivery	Provider	Venue
Scientific	• Livestock management • Harmful residues • Understanding new Acts	D	N/A	1-2 days 1 day	Face-face	Uni/TAFE/PEP	Onsite
Mineral exploration	• Computer software usage • Plant taxonomy • Quantitative monitoring • Updating techniques • Vegetation id • Radiation protection • Waste treatment	D	Vary	Vary	Face-face	TAFE/ PEP/ Inhouse	Onsite
Mineral exploration	Work practices	D	N/A	1-2 days	Presentation		
Developer	• Soil quality • Water quality	D		2 days	Face-face	Uni/TAFE	
Developer	• General issues • Environmental audit • Site management	E	N/A	5 days 2 days 2 days	Flex	Uni/PEP	Offsite
Farming services	Management	D	N/A	2 days	Face-face	TAFE	Regional
Milk processing	• Environmental legislation • Environmental auditing	D	N/A	1 day	Face-face	PEP	Onsite

Professionals

Activity	Training	D/E	Level	Length	Delivery	Provider	Venue
Professional association	• Environmental auditing • Environmental monitoring • Pollution control • Waste minimisation • Stormwater treatment & disposal • Exotic pest control	E	 Cert. Cert. Cert. N/A N/A N/A	 6 mths 6 mths 3 mths 4 weeks 1 week 1 week	Face-face	TAFE	Onsite
Professional association	• Awareness • Sustainable development • Energy conservation	D	N/A Cert. Cert.	2 days 1 mth 1 mth	Seminar Lectures/workshop	Prof. Ass. TAFE TAFE	Various Head office
Consulting engineers	• Environmental management • Environmental law/ liabilities BS7750 and related standards • Legislation/ standards/ requirements	E	Dip/ Cert	1 yr/6 mths	Face-face	Uni/TAFE	Inst.
Consulting engineers	Hydrology		N/A	5 days		Uni	Offsite
Health care/ safety	Chemical effects on environment		Cert.	Varying	Lecture	TAFE/Uni	Campus
Health care/ safety	• Pest control • Clean production • Chemical handling • Disposal regulations & codes	D		1-2 days	Face-face	Any competent provider	Offsite
Petroleum	Vegetation rehabilitation	D	N/A	1-5 days	Face-face/ video	TAFE/Uni/ Inhouse	Various
Conservation	• Environmental law • Environmental ethics	D	N/A	8 days	Face-face	PEP/Uni	Inhouse
Project management	Site contamination	D	N/A	1 day	Face-face	TAFE	
Project management	Detailed awareness of environmental Acts					TAFE/PEP	

Administrative

Activity	Training	D/E	Level	Length	Delivery	Provider	Venue
Local government	Introduction to legislation	D	N/A	1/2 to 3 days	Face-face/ video	Not vital	Not vital
Local government	Environmental assessment of development	D	N/A	2-3 days	Seminar	PEP	Regional
Local government	• General training • Public relations • Report preparation • Technical information • Act interpretation	D	N/A		Face-face	TAFE/ PEP	
Local government	• Environmental management • Policy • Legislation	D	Award	5 days	Work-shops/ lects.	Uni/TAFE	Offsite
Local government	General environmental overview	D/E		1 week		Industry/U ni	Onsite
Manufacturer	Safety	D	N/A	1 day		On-job	Onsite
Engineering/ building/ construction	• Contamination • Environmental law	D		4-8hrs	Face-face, video, slides	PEP	Onsite
Engineering/ building/ construction	Specific details as they relate to the industry	D		1 day	Face-face	Inhouse	
Winemaking/ grapegrowing	Full knowledge of the Act and implications - vineyard and the environment winery and the environment	E					
Winemaking/ grapegrowing	Environmental management systems	D	N/A		Various	Inhouse	Onsite
Petroleum	Environmental principles	D	N/A	1-2 days	Face-face	TAFE/Uni/I nhouse	Various
Fisheries	Cost/return	D	N/A	As req.	Work-books/ videos	TAFE	Onsite
Conservation	Planning	D	N/A	2 days	Face-face	PEP	Inhouse
Water management	Legislation	D		1 day	Conf'nce	?	Adelaide

Technical

Activity	Training	D/E	Level	Length	Delivery	Provider	Venue
Local government	• Awareness • Understanding of environmentally sustainable development • Specific area training	D/E	Cert.	1 yr	Face-face	TAFE	Off-site
Local government	General environmental overview	D/E		2 days		Inhouse	Onsite
Local government	Specific environment issues	D	Cert.	1-2 days	Face-face	TAFE	TAFE
Local government	Introduction to legislation	D	N/A	½ to 3 days	Face-face /video	Not vital	Not vital
Local government	• Stormwater disposal • Marine environment • Water quality • Contaminated land • Land rehabilitation • Waste disposal	D	Cert.	5-14 days	Face-face	Uni.	
Local government	• Noise control • Water analysis • Clean air	D	Award	5 days 15 days 5 days	Video/ lecture	TAFE	TAFE
Local government	General awareness of legislative responsibilities	Flex.	Flex.	Flex.	Flex.	Flex.	Flex.
Local government	Changes in legislation	D	N/A	1 day	Face-face	LGTA	Central
Local government	• Waste management • Water protection	D	N/A	2-3 days	Face-face	PEP	Regional
Local government	• Dump maintenance • Stormwater • Effluent	D	N/A		Face-face	TAFE/ PEP	Regional
Local government	• Public relations • Act interpretation	D			Face-face	TAFE/ PEP	Onsite

Technical

Activity	Training	D/E	Level	Length	Delivery	Provider	Venue
Local government	• Technical training • Environmental management	D	Cert.	2 days	Practical	TAFE	Offsite
Local government	Animal & pest control	D	N/A	2-5 days	Face-face	TAFE	Onsite
Local government	Broad knowledge of environmental issues	D	N/A	1 day	Face-face	Uni/TAFE	
Local government	• Noise quality • Air quality	D	N/A	2 day	Face-face	EPA	Onsite
Local government	General environmental overview	D	N/A	1-2 days	Seminar	LGTA	On-off site
Engineering/ building/ construction	Specific details as they relate to the industry	D		1 day	Face-face	TAFE/ inhouse	
Engineering/ building/ construction	Awareness of environmental requirements	D		2 hrs	Face-face	PEP	Onsite
Engineering/ building/ construction	• General environmental awareness • Specialised course on specific environmental issues	D/E		2 yrs		External	On-off site
Winemaking/ grapegrowing	Specific issues to winery and vineyard	E	Cert.	10x2 hrs	Lectures, videos, books	TAFE	TAFE
Winemaking/ grapegrowing	Technical	D	N/A		Various	TAFE/ inhouse	Offsite
Professional association	Environmental management appreciation	D	Cert.	2 hrs own time	Face-face	Uni	Lecture room & onsite
Petroleum	Vegetation recognition, rehabilitation	D	N/A	1-5 days	Face-face	TAFE	Onsite/ TAFE

Technical

Activity	Training	D/E	Level	Length	Delivery	Provider	Venue
Petroleum	• Detailed interpretation of regulatory requirements • Environmental management systems • Environmental practices						
Fisheries	Environmental methods	D	N/A	As req.	Work-books/ videos	WEA	Onsite
Conservation	Environmental studies	D	Award	1 yr	Face-face	TAFE	TAFE
Motor vehicle repairs	Updating in relation to CFCs	E	N/A	1 day	Presenta-tion	TAFE	
Environmental consultant	Soil testing	D	N/A	2 days	Face-face	TAFE	Offsite
Wastewater	Operational management	D	N/A	2-3 days	Face-face	TAFE	Onsite
Scientific	Harmful residues	D	N/A	1-2 days	Face-face	TAFE/ PEP	
Mineral exploration	• Instrument operation • Environmental law	D	Vary	Vary	Face-face	TAFE/ PEP/ Inhouse	Onsite
Mineral exploration	• Minimising environmental disturbances • Rehabilitation techniques • Industry specific	D	N/A	1-2 days	Presenta-tion		
Water management	Scientific training	D	Cert.	1-3 days	Seminar/w orkshop	?	Adelaide
Forestry	Native forest					TAFE	Onsite
Land management	Pest control					TAFE	

Operatives

Activity	Training	D/E	Level	Length	Delivery	Provider	Venue
Local government	Awareness issues	D	N/A	5 days	Face-face	Inhouse	Onsite
Local government	Pest control	D	Cert.	2 days	Face-face	TAFE	Onsite
Local government	Specific environmental issues	D		1-2 days	Face-face	TAFE	TAFE
Local government	Introduction to legislation	D	N/A	1/2 to 3 days	Face-face/ video	Not vital	Not vital
Local government	Pest control	D	Award	5 days	Video/ lecture	TAFE	TAFE
Local government	General awareness of legislative responsibilities	Flex	Flex	Flex	Flex	Flexible	Flex
Local government	Vegetation	D		1 day			Onsite
Local government	Legislative	D	N/A	1-2 days	Face-face	LGTA	Central
Local government	• Public relations • Act interpretation	D			Face-face	TAFE/ PEP	Onsite
Local government	Chemical contamination	D	N/A	5 day	Face-face	TAFE	Onsite
Local government	• Native vegetation control • Waste management	D		1 day	Face-face	LGTA/ TAFE	Onsite
Manufacturer (smallgoods)	Environmental industrial waste	D		1/2 day		TAFE	Onsite
Manufacturer	Environmental awareness	D	Cert.	1 day	Face-face	Inhouse/ TAFE	Onsite
Manufacturer (cleaning products)	Recycling	D	N/A				Onsite
Manufacturer (textured coatings)	Waste management	D/E	Award	3 mths	Face-face/ videos	TAFE	
Manufacturer (fruit juice)	Environment and waste	E	N/A	2hrs	Present'n	TAFE	Onsite

Operatives

Activity	Training	D/E	Level	Length	Delivery	Provider	Venue
Mineral exploration	• Waste management • Rehabilitation • Computer software usage	D	Vary	Vary	Face-face	TAFE/ PEP/ Inhouse	Onsite
Mineral exploration	• Minimising environmental disturbances • Rehabilitation techniques • Industry specific	D	N/A	1-2 days	Presenta-tion	--	
Mineral exploration	• Environmental protection • Pollution control	D	N/A	1 day	Face-face	TAFE/ PEP	Onsite
Mineral exploration	Aboriginal heritage	D	N/A	1 day	Presenta-tion	TAFE	TAFE
Water management	• Chemicals • Landcare	D	Cert.	1 day	Seminar	TAFE	Onsite
Forestry	Management					TAFE	Onsite
Plant and animal control	Pest control	D	N/A	2 days	Face-face	TAFE	Onsite
Milk processing	• Legislation • Responsibilities • Auditing	D	N/A	1 day	Face-face	Inhouse	Onsite
Plumbing and gasfitting	Dumping	D	N/A	?	Face-face		

Operatives

Activity	Training	D/E	Level	Length	Delivery	Provider	Venue
Engineering/ building/ construction	Dust control	D	N/A	1/2 day	Face-face	Inhouse	Onsite
Engineering/ building/ construction	• Contamination • Environmental law	D		4-8 hrs	Face-face, video, slides	PEP	Onsite
Engineering/ building/ construction	Specific details as they relate to the industry	D		1 day	Face-face	Inhouse	
Engineering/ building/ construction	Awareness of environmental requirements	D		1 day	Face-face	PEP	Onsite
Engineering/ building/ construction	• General environmental awareness • Specialised courses to particular areas of responsibility	D/E		2 days		External	Onsite
Farming and grazing	• Spraying • Tree management • Salt management		N/A	1 day	Field day	TAFE, Soil board, DPI	Onsite
Farming and grazing	General environmental overview - all areas	D	N/A	2-4 days	Face-face	TAFE	Local
Farming and grazing	Pest control	D		2 days		TAFE	
Pest/weed control	Pest control	E	Cert.	1-2 days	Seminar	TAFE	TAFE
Pest/weed control	Pest control	D/E	Award	1 day	Face-face	Industry	Inhouse
Pest/weed control	Pesticide usage	D	Cert.	2 days	Open learning	TAFE	Onsite
Pest/weed control	Pest control	D	N/A	2 days	Face-face	TAFE	Onsite
Pest/weed control	Health & safety	D		12 mths	Work-books	TAFE	Onsite

Operatives

Activity	Training	D/E	Level	Length	Delivery	Provider	Venue
Pest/weed control	Pest control		N/A		Face-face	TAFE	
Pest/weed control	Pest control	D	N/A	12 mths	Face-face, video, work-books	TAFE	Onsite
Winemaking/ grapegrowing	Waste regulations	D	N/A	1 day	Face-face	TAFE	Onsite
Winemaking/ grapegrowing	Technical	D	N/A		Various	TAFE/ inhouse	Offsite
Professional association	Park management issues	D	Cert.	6 hrs work time	Face-face	TAFE	Lecture room & onsite
Health care/ safety	• Pest control • Legislation	D	N/A	2 hrs 4 hrs	Presenta-tion Workshop	Govt. dept.	Onsite
Recycling/ waste	Recycling materials	D		1 day	Face-face	Inhouse	Onsite
Recycling/ waste	Recycling	D	N/A	1 day	Video	TAFE	Onsite
Petroleum	Environmental protection approaches and methods						
Petroleum	Physical environment	D	N/A	1 day	Face-face	PEP	Onsite
Fisheries	Weedicides and pesticides	D	Cert.	As req.	Work-books/ videos	TAFE	Onsite
Conservation	Negotiating skills	D	N/A	6 days	Face-face	PEP	Inhouse
Conservation	• Chemicals • Communication • Regional geography	D	N/A	4 days 5 days 6 mths	Face-face	TAFE	
Environmental consultant	Farm chemical users course	D/E	Non exam	2 days	Face-face	TAFE	Onsite

Other

Activity	Training	D/E	Level	Length	Delivery	Provider	Venue
Local government (council members)	Introduction to legislation	D	N/A	1/2 to 3 days	Face-face/ video	Not vital	Not vital
Local government (all staff)	General environmental overview	D	N/A	1 day	Face-face	LGTA	Onsite
Local government (all staff)	• Water quality • Energy conservation • Soil conservation • Waste management • Biodiversity						
Local government (outside staff)	Weed spraying	D		1-2 day	Face-face	TAFE	Onsite
Local government (all staff)	Environmental awareness - responsibilities of organisation	Flex	Flex	Flex	Flex	Flexible	Flex
Manufacturer (pharmaceutical)	Overview of relevant environmental laws which affect daily operations	D	N/A	1/2 day	Video/ present'n	TAFE	Onsite
Manufacturer (specialty chemicals)	Policy and procedures relating to area of responsibility	D	N/A				
Professional association (members)	Environmental management	W/E	Cert.		Face-face	TAFE	TAFE
Health care/ safety (all staff)	• Environmental awareness • Waste reduction	D	N/A	Varies		TAFE	Onsite
Health care/ safety (nursing staff)	Contaminated waste - minimisation	D	N/A	2 hrs	Presenta-tion	Envir. group	Onsite
Health care/ safety (all staff)	Recycling	D	N/A	2 hrs	Presenta-tion	Envir. group	Onsite
Conservation (team leaders)	Supervision	D/E	Cert.	20 hrs	Face-face, practical	TAFE/ PEP	Class & onsite

Other

Activity	Training	D/E	Level	Length	Delivery	Provider	Venue
Conservation (volunteers)	Conservation concepts	D/E	Pre-voc cert		Face-face. practical	TAFE/ PEP	Class & onsite
Motor vehicle repairs (all groups)	Update of all responsibilities in relation to any areas of environmental controls in the industry	D	N/A	1 day	Presenta-tion/video	BP	
Environmental consultant (land managers. solar technologies)	Environmental management package	D	Dip. Cert.	3 yrs 1 yr	Face-face/ work-shops/ videos	TAFE	Onsite
Mineral exploration (all staff)	Environmental awareness	D	N/A	1 day	Face-face	Inhouse	Onsite
Mineral exploration (Aboriginal liaison)	• Understanding Aboriginal culture • Ability to relate to Aboriginal people	D	Vary	Vary	Face-face	TAFE/ PEP/ Inhouse	Onsite
Water management (all staff)	Water resources	D	N/A	1-2 days	Face-face	TAFE/ PEP	Onsite
Resource centre (volunteers)	All areas	D/E	All	Vary	All	As req.	Vary
Volunteer management (all staff)	Environmental awareness	D	N/A	1/2 day	Various	Various	Onsite

Appendix 7

Volunteers: What is their main role?
What training do they need?
How many require training?

Main activity of organisation	Volunteer's role	Training need	No's needing training	Support for training
Local government	Landcare			Don't know
Local government	• Fire protection • Emergency service			Very small
Local government	Community care			Not at all
Local government	Planning	• Awareness of issues • Communication skills		Don't know
Local government	• Roadside/reserve vegetation planting • Roadside seed collection • Various projects	• Tree planting • Direct seeding • Seed collection • General understanding of environmental issues	2 6 20	Very small extent
Local government	Clean-up days	Health and safety	2	Small extent
Local government	Co-ordination of hands-on work	Supervision of volunteers	5	Small extent
Local government	• Coastal planning • Tree planting • Townscape	• Coastal care program • Landcare • Street planting	10 10 10	Small extent
Local government	• Landcare • Revegetation	• Soil erosion • Land management • Landcare • Horticulture • Soil management • Herbicides	20 20	Very small extent
Local government	• KESAB • Clean-up day		3-4	Small extent
Local government	Caretakers	Legislative awareness	2-3	Very small extent
Local government	Native vegetation planting	Recognition & forward planning	5	Very small extent
Local government	Resident s assisting 'Greening' committee	• Plant ID • Hand control of weed species	20+	Don't know
Local government	Advisory group	• Strategic planning • Land management • Vegetation awareness	6	Not at all

Main activity of organisation	Volunteer's role	Training need	No's needing training	Support for training
Local government	• Bus drivers • Library staff • Childcare	• Environmental awareness & application to daily tasks (ie. maintenance of vehicles) • Dissemination of environmental information • Environmental awareness application to daily tasks/ operations (ie. recycling)		Very small extent
Manufacturing	• Manufacturing • Packaging	• Safe work • Safe handling • Safe disposal • Safe packaging	2	Small extent
Farming & grazing	Water sampling			
Farming & grazing	• Trees • Land • Water	• Shelter belts • Erosion salt • Drainage		Don't know
Farming & grazing	• Fire fighting • SES		15 12	Small extent
Professional association	Seminar organisers	Seminar management	5	Small extent
Professional association	• Seminar - conference co-ordinators • Secretary • President	• Important issues (focus) • Precis of all current environmental issues • Precis of all current environmental issues	7 7 1	Very small extent
Health care/safety	• Nursing • Administration • Porters	Recycling	3500	Small extent
Health care/safety	Kiosk operators	Observation of recycling guidelines	20	Very small extent
Petroleum production/ distribution	• SES • CFS	Emergency response related to petrol tanker accidents	70 70	Great extent
Conservation/ environmental protection	• Labour force environment & repair • Labour force survey	Many areas	200	Great extent

Main activity of organisation	Volunteer's role	Training need	No's needing training	Support for training
Environmental consultant	• Data collection • Flora/fauna • Compilation of dbase • Computer dbase • Coastal reclamation • Landcare & rehabilitation	• Methodology of surveys • Flora and fauna ID • Dbase understanding & operation • Knowledge of marine & coastal management • Methodology of erosion control & tree corridors • Roadside vegetation	>50 10 >50 100	Small extent
Environmental consultant	• Weed eradication • Feral animal eradication	• Mapping • Weed control management • Biological surveys • Land management		Small extent
State govt. dept.	Resource protection/ conservation	• Chainsaw use & maintenance • Chemical safety • OH&S Act	Various	Very small extent
Natural resource management	• Reserve management • Habitat management	Full range	50yr 20yr	Very small extent
Natural resource management	Many roles depending on location and management plan	OH&S	Dozens	Very small extent
Natural resource management	• Tree propagation • Tree planting			Small extent
Education & training		• Secretarial skills • Wordprocessing • Design, layout, publications • Organisation of seminars, fieldtrips, conferences	1 1 1	Great extent
Providing free trees	• Raising seedlings • Seed collection • Planting seedlings	Written instruction & workshops	3000/yr 300/5yrs 3000/yr	Small extent
Volunteer management	• Interviews • Administration duties • Reception • Computing • Fundraising	Awareness of issues and legislation only	40	Very small extent

Appendix 8

Training issues: In what areas is inhouse environmental training provided?
At what level?
How is the training provided?

Main activity of organisation	Area in which training is provided	Level(s) of staff trained	How training is provided
Local government	Short & long-term management, environmental issues	All environmental health employees	• Inhouse • External
Local government	New legislation	Relevant sections	2-3 hr session by manager
Local government	• Environmental awareness • Site rehabilitation (quarries etc)	• Management • All employees	On-going
Manufacturing (Detergent)	• Environmental issues • OH&S issues	• All staff (including agents)	Continuous
Manufacturing (Packaged goods)	Environmental design in product development Environmental awareness	Management	On-going
Manufacturing (Smallgoods)	Recycle waste	All levels	Part of induction training
Manufacturing (Textured coatings)	• Company safety, health and environmental policy and its implications • SH&E management system, standards and model procedures • Legal framework • Practical approaches for tackling the problems of environmental health and safety • Occupational health including medicine, toxicology and occupational hygiene • Environmental protection, including the law, standards, waste disposal and minimisation, resources and community issues • Systems and procedures available for effective planning and control. This includes contractor safety, clearances at work - accident and incident investigation • Safe systems at work - hazard and risk identification • An outline of the Responsible Care program and the industry commitment	All safety, health and environmental managers Other management Supervisors	3 day residential
Manufacturing	Dangerous substance transport	Booking office staff	2hr in-house session

Main activity of organisation	Area in which training is provided	Level(s) of staff trained	How training is provided
Manufacturing (Specialty chemicals)	• Induction • Operator 'task' • JOBTASK analysis • OH&S training (specialised) Safety & environment conference (every 2-3 yrs inhouse)	• All staff • Line management • Site env. co-ordinators • Management & co-ordinators	• 2-4hrs • Varies (1hr/mth) • 1 day/yr • 3 days
Retail	Hazardous substance in paint production	Management	Ongoing
Retail	New products conforming to environmental needs	All staff	Continuing
Retail	Contaminated soils	• Sales staff • Management	1hr in-house training session by outside consultant
Heavy engineering/building/ construction	• Company's OH&S policy • Asbestos handling/ regulations • Dangerous goods/ chemicals	• All staff • Management/shop stewards • Engineering/shop floor	• Induction (4hr) • In-house (16hr) • In-house (2hr)
Heavy engineering/building/ construction	Waste minimisation	• Site staff • Direct labour	Ongoing
Heavy engineering/building/ construction	• Ecologically sustainable development • Environmental management • Specific environmental issues	• Management • Professional • Technical staff • Professional • Technical • Professional • Technical	• 1 day training session • 2 day training session • Attendance at seminars/ conferences as available
Pest/weed control	Correct procedures in all areas of pest control	All staff	Regular staff meetings
Pest/weed control	Keep employees up-to-date		
Pest/weed control	Environmental awareness	All staff	
Pest/weed control	• Chemical usage & storage • Chemical application	Pest operators	• Videos • In-house
Professional association	Latest environmental initiatives		• Discussions with environmental managers • Newsletters • Publications • Seminars

Main activity of organisation	Area in which training is provided	Level(s) of staff trained	How training is provided
Professional association	• Waste disposal • Exotic pest control • EPA • Environmental Health Act • Recycling/waste minimisation • Environmental auditing	EHO	Full day seminars
Recycling	Environmental awareness	• Management • All staff	On-job continuous
Recycling	• Contamination of waste • Sorting of waste • Proper disposal of waste • Waste minimisation • Energy and water economy/ consumption	All employees	
Recycling	• Reduce • Reuse • Recycle	All staff	Continuous
Recycling	Sorting glass for recycling	Workers	On-the-job experience
Health care/safety	Environmental awareness	Operatives	In-house as required
Health care/safety	• Infection control • Biodegradable detergents • Reusable/washable dusters/ cotton mops/polishing pads • OH&S training	• General services - all staff • All domestic staff • All domestic staff • General services - all staff	• 45 min in-house • 1hr in-house • 1hr in-house • 3hr in-house
Health care/safety	• Environmental management • Recycling • Waste management • Waste compacting • Clean Air Act, sewerage, asbestos etc • Lung function technicians	• All staff • All staff • All staff • Handymen • Maintenance engineer • Technicians	• On-the-job • On-the-job • On-the-job • By maintenance engineer & suppliers • Attends professional association, receives pertinent information (ie. pest control, updates etc) • Consultation (ie. Dept. of Labour)
Consulting engineer	• Project management • Geographic information systems	All levels	40hrs
Petroleum production/ distribution	Environmental compliance	• Management • Operational	1 day session

Main activity of organisation	Area in which training is provided	Level(s) of staff trained	How training is provided
Petroleum production/ distribution	HSE issues	All levels	Comprehensive training using a variety of media
Petroleum production/ distribution	• Environmental systems • Benchmarks • Programs • Environmental awareness • Environmental auditing	• Technical • General Operatives • Business managers	• 2 day workshop • 2 day workshop • 1 day workshop
Petroleum production/ distribution	Training is mainly in-house through packages developed and supplied by BPO, AIP or APADA	All levels involved in HSSE	• Videos • Questionnaires
Petroleum production/ distribution	Environmental awareness	• Management • Drivers • Office staff	
Fisheries	• Waste management • Sustainable farming • Planting trees		
Conservation/ environmental protection	• All areas of conservation • Team leadership • Community involvement	Team supervisor	On-the-job
Conservation/ environmental protection	• Air quality • Water environment • Noise control & assessment • Marine pollution • Waste/recycling	All staff	1/2 day in-house
Motor vehicle repairs	Pollution laws	Management	1-2 hr in-house sessions
Environmental consultant	• Technical in-field procedures • Legislative changes • Analytical interpretation	• Technical staff • Management & technical staff	• On-site training • Exchange program with other branches • In-house training
Environmental consultant	Environmental awareness	• Volunteers • All staff	• 2hr in-house training • Outside seminars • Ongoing
State Govt. Dept.	• Environmental awareness • Environmental techniques	• All staff • Field staff	• 5hr in-house • Guidelines • Codes of practice • Meetings • Workshops • Short courses
State Govt. Dept.	• Building codes • Heritage Act • Topical issues	• Management/ supervisors	• 2hrs in-house • 1/2 day in-house
State Govt. Dept.	• As specified by in-house safety committee • As built into management development program	• All staff • Management	• As needed • NSW Little Bay & in-service projects (1yr, part-time)

Main activity of organisation	Area in which training is provided	Level(s) of staff trained	How training is provided
Natural resource management	• Landcare • Water management • Native vegetation	All	Outside workshops
Natural resource management	Full range of natural resource management competencies	All levels	Monthly internal/some external
Mineral/gas exploration	• Minimising ground disturbances • Rehabilitation techniques	• Technical/operators/ professionals	• Meetings • Infield
Mineral/gas exploration	Environmental awareness at largest operations	Technical/operator	Part of site induction course
Mineral/gas exploration	• Environmental awareness and rules • Laws applying on site • Procedures for carrying out work to minimise environmental disturbances	All levels	• 1hr induction course • Handbooks
Water management/ conservation	• Legislative awareness • Environmental awareness • Risk assessment	All staff	• 2hr in-house training • 3hr in-house training
Aerial spraying	• Awareness of operational requirements • Law	All staff	Continuous updating
Developer	Environmental induction program	All staff	1/2 day in-house
Animal and plant control	• Principals & practice of vertebrate pest control • Weed control (legislative)	Technical & professional	• 10 day live-in course aimed primarily at local govt. but with Adelaide Uni natural resource students • 2 day course for local govt. & industry operators
Abattoir	Awareness of any EPA requirements which involve operators particular task	Plant operators	On-the-job training
Land management	Land management in rural resources	OPS 3	In-house practical
Resource centre	• Research of environmental issues • Community consultation • Co-ordination/team leadership • Community development	All staff	• Resource centre • Public forum • Working (task) groups • Field work (projects & programs)

Main activity of organisation	Area in which training is provided	Level(s) of staff trained	How training is provided
Fire & incident prevention	• Pollution control • Effects of fire on the environment • Safety at incidents	• Volunteers & paid staff • Local council fire prevention officers	• Part of other training course • Part of fire prevention course • Part of other training course
Powder coating	Environmental awareness	All staff	On-the-job
Providing free trees	Seed collecting	All staff	• On-the-job experience • Seminars